A CASE CONTROL STUDY ON LIPID PROFILE AND RISK LEVEL OF CORONARY ARTERY DISEASE AMONG PATIENTS ADMITTED IN SELECTED HOSPITAL, MADURAI.

DISSERATION SUBMITTED TO THE TAMILNADU Dr.M.G.R MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE IN NURSING

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BY

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2016-2018

DECLARATION

I hereby declare that the present dissertation titled **" A case control study on lipid profile and risk level of Coronary Artery Disease among patients admitted in selected hospital, Madurai"**, outcome of the original research work undertaken and carried out by me, under the guidance of Research Guide Prof. Dr.A.Arvin Babu, Ph.D, Principal, Cherran's College of Nursing and the Clinical Speciality Guide Mrs. Ramalakshmi, M.Sc(N).

I also declare that the material of this study has not found in anyway, the basis for the award of any degree/diploma in this University or any other University.

By

301610251

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I owe my sincere thanks to **God Almighty**, who accompanied and directed me to achieve success throughout this study.

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Abstract

ABSTRACT

A retrospective case control study to assess the effect to cause relationship between lipid profile and risk level of CAD among the patients admitted in Saravana hospital, Narimedu, Madurai was done by 302610251as a partial fulfillment of requirement of the Degree of Master of Science in Nursing at Cherran's college of Nursing, Coimbatore, under the Tamil Nadu Dr.M.G.R. Medical University, Chennai, October 2018.

The objectives of the study were

- To assess the exposure rate of lipid profile and risk level of CAD among patients admitted in selected hospital
- To assess estimation of risk in lipid profile and risk level of CAD among patients admitted in selected hospital
- To find out the association between the Demographic variables and risk level of CAD among patients admitted in selected hospital

The Research Hypothesis formulated and tested were :

H_1: There is a significance exposure rate of lipid profile and risk level of CAD among patients admitted in selected hospital.

H_2: There is significance estimated risk in lipid profile and CAD among patients admitted in selected hospital.

H_3: There is a significant association between the demographic variables and risk level of CAD among patients admitted in selected hospital.

Extensive literature was done for the present study and the reviews were presented in the following headings,

- **Studies related to prevalence of CAD and its risk factors**
- **Studies related to prevalence of dyslipidemia in CAD**
- **Studies related to lipid profile and severity of CAD**
- **Studies related to association between demographic variables and CAD**

The conceptual framework adopted for the present study was based on Betralanff's theory (1968) General system theory. The research design selected for the present study was retrospective case control study to investigate effect to cause relationship between lipid profile and CAD. The independent variable was lipid profile and the dependant variable was CAD. The data collection tool was validated by one physician and four nursing experts. Reliability was established by test-retest method, r=0.87. The samples for the study were chosen by purposive sampling technique, 50 samples were in the cases and 50 samples were in the controls. Data was collected for a period of one month and it was collected by using lipid profile test.

The data collected were edited, tabulated, analyzed and interpreted manually. In cases ¾ the of the participants had abnormal lipid profile. This is three and half times higher than the controls. In controls only 11(22%) had abnormal lipid profile which shows that frequency rate of CAD was definitely higher among the participants got scores between 6-10 than the patients got scores between 1-5. Patients who had scored between 6-10 showed a risk of having CAD 10.09 times more that of the patients scored between 1-5.

There was a significant relationship between risk level of CAD and all the demographic variables among cases.

The findings of the study revealed that patients with dyslipidemia have a higher risk of getting CAD than the patients having normal lipid profile test. The implications, limitations, recommendations, and conclusion were clearly spelt.

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LIST OF ABBREVIATIONS

S.No	ABBREVIATION	EXPLANATION
1.	Fig	Figure
2.	H	Hypothesis
3.	M.Sc(N)	Master of Science in Nursing
4.	N	Total number of samples
5.	No	Number
6.	%	Percentage
7.	SD	Standard Deviation
8.	MD	Mean Difference
9.	P	Probability
10.	ANOVA	Analysis of variance
11.	USA	United States of America
12.	CAD	Coronary Artery Disease
13.	CHD	Chronic Heart Disease
14.	CVD	Cardio Vascular Disease
15.	DM	Diabetic Mellitus
16.	HT	Hypertension
17.	BMI	Body Mass Index
18.	LDL-C	Low Density Lipo Protein Cholesterol
19.	HDL-C	High Density Lipo Protein Cholesterol
20.	TG	Triglycerides
21.	TC	Total Cholesterol
22.	CHO	Cholesterol
23.	ECG	Electro Cardio Gram

24.	ACS	Acute Coronary Syndrome
25.	SPSS	Statistical Package for Social Sciences
26.	CI	Class Interval
27.	ICCU	Intensive Coronary Care Unit
28.	ICU	Intensive Care Unit
29.	NGT	Normal Glucose Tolerance
30.	IGT	Impaired Glucose Tolerance
31.	AHA	American Heart Association
32.	WHO	World Health Organisation
33.	NCD	Non Communicable Disease
34.	NCEP	National Cholesterol Education Programme
35.	AIIMS	All India Institute of Medical Science
36.	ICMR	Indian Council of Medical Research
37.	Fre	Frequency
38.	MI	Myocardial Infarction
39.	Q	Question
40.	CHF	Congestive Heart Failure
41.	i.e	That is
42.	S	Significant
43.	NS	Not significant
44.	P	Probability

Chapter –*I*

Introduction

CHAPTER - I

BACKGROUND OF THE STUDY

“ Put a full stop to coronary artery disease before it stops you ”

Coronary artery disease is a leading cause of morbidity and mortality in many countries worldwide and is estimated that it will be the single largest cause of disease burden for the next 20 years. Each year, approximately 3.8 million men and 3.4 million women die from CAD. In USA someone suffers a coronary artery disease every 26 seconds and someone dies from CAD every minute. In Europe, between 1 in 5 and 1 in 7 European women die from CAD, and the disease accounts for between 16% and 25% of all deaths in European men.

Coronary artery disease, a blockage of the arteries that supply blood to the heart, is the most common type of heart disease. About 600,000 people in the United States die from heart disease every year—that’s one in four deaths. Every year, 715,000 Americans have a heart attack. Fifteen percent of people who have a heart attack will die from it.

Heart disease affects whites and African Americans the most, accounting for 24.3 and 24.1 percent of deaths, respectively. Asians and Pacific Islanders are at third-highest risk for a heart disease-related death, at 22.5 percent. It accounts for 20.8 percent of deaths in the Hispanic community, and 17.9 percent in American Indians and Alaska Natives.

According to **WHO** report 2012 in collaboration with World Heart Federation, Turkmenistan saw the highest rate of deaths from cardiovascular disease with 712 deaths per 100,000 people. Kazakhstan has the second highest rate, with 635 deaths per 100,000. Mongolia, Uzbekistan, Kyrgyzstan, Guyana, Ukraine, Russia, Afghanistan, Tajikistan and the Republic of Moldova all have more than 500 deaths per 100,000. The majority of these deaths are preventable, and despite preconceptions that men are more susceptible, women are in fact equally likely to be affected.

AHA reported that CVD was the most common underlying cause of death in the world in 2013, accounting for an estimated 17.3 million (95% uncertainty interval, 16.5–18.1 million) of 54 million total deaths, or 31.5% (95% uncertainty interval, 30.3%–32.9%) of all global deaths. In 2017, Among adults ≥20 years of age, 12.2% reported having a parent or sibling with a heart attack or angina before age 50 years, with the highest sex-specific prevalence observed among non-Hispanic white males and females.

Health data compiled from more than 190 countries show heart disease remains the No. 1 global cause of death with 17.3 million deaths each year, according to "Heart Disease and Stroke Statistics — 2015 Update: A Report From the American Heart Association." That number is expected to rise to more than 23.6 million by 2030, the report found.

One fifth of the deaths in India are from coronary artery disease and it will account for one third of all deaths. Many of these Indians will be dying young. Heart disease in India occurs 10 to 15 years earlier than the west. There are an estimated 45 million patients of coronary artery disease in India. An increasing number of young Indians are falling prey to coronary artery disease. With millions hooked to a roller-coaster lifestyle, the future looks even more grim.

CAD is the first among top five causes of deaths in Indian population rural vs. urban, economically backward vs. developed states, men vs. women and at all stages vs. middle age. In 2000, there were an estimated 29.8 million people with CAD in India out of a total estimated population of 1.03 billion or a nearly 3% overall prevalence. In 2003, the prevalence was estimated to be 3-4% in rural areas and 8-10% in urban areas according to population based cross sectional surveys. However in 2008, they were found to be 6% and 12% respectively. In 2011, WHO reported the age standardized CAD mortality rates among males and females in India (per 100,000) at 363-443 and 181-281 respectively. The country wise statistics of the WHO on NCDs estimates NCDs account for 53% of the total deaths in India, out of which CAD has a major share of 24%.

Apart from a high overall prevalence, there are regional variations in the prevalence of CAD. In 2015 Prevalence of CAD in urban areas of Northern states such as Jammu Kashmir, Delhi and Uttar Pradesh, and Western states such as Rajasthan is reported to be around 6-10%. The rates in the rural areas were 6-7% in Jammu and Kashmir, 3-5% in Himachal Pradesh and Punjab. In Andhra Pradesh, the overall prevalence of CAD was found to be 5.4% while the age standardized prevalence was 5.1%. Urbanised states of Kerala and Mumbai reported very high CAD mortality rate approaching 500/100,000 for men and 250/100,000 or women. In urban and rural communities in Delhi, the prevalence of CAD was 14.8% and 9.7% while in Lucknow the overall prevalence was found to be 8.8% in urban and 3.8% in rural areas. Overall, the mortality is highest in the South Indian states when compared to other parts of India.

Death from CAD is higher in Kerala than that of rural Andhra and simililar to urban Chennai, though it has the highest life expectance in India-75- 11 years higher than national average of 64 years, and just 3 years shy of 78 years in the US. The age adjusted CAD mortality rates per 100000 are 382 for men and 128 or women in Kerala. These CAD rates in Kerala are higher than those of Industrialized countries and 3 to 6 times higher than Japanese and rural Chinese. Prevalence of heart disease in rural Kerala is 7%, which is nearly double that of north India.

Cardiovascular diseases are the most common health related issues witnessed in Tamilnadu, reports a recent study released by Lancet recently. The report showed tht NCDs constitute 72.3% of burden disease in Taminadu, whereas CVD constitute 37.4 % of it. The research revealed that Tamilnadu lost 4788 healthy years to ischemic heart disease in the last 26 years against the national mean of 3062. The article written by Pushpa Narayanan on December 2017 in Times of India death from ischemic heart disease in 1990 was 6.6% increased upto 14.3% in 2016.

CAD can develop at any age. It refers to a group of closely related syndromes caused by an imbalance between the myocardial oxygen demand and the blood supply. Depending on the rate severity of coronary artery narrowing and myocardial response,

one of four syndromes may develop: angina pectoris, acute myocardial infection, sudden cardiac death and chronic heart disease with congestive heart failure.

Several medical conditions and a number of risk factors are thought to increase the likelihood of developing CAD. It can be divided into two, which are controllable and uncontrollable risk factors. Controllable risk factors are hypertension, Hypercholesterolemia, smoking, obesity, sedentary lifestyle, diabetes, stress, hyperhomocysteinemia, depression and anxiety. However uncontrollable risk factors are gender heredity and age.

Hypercholesterolemia and dyslipidemia is considered as one of the most common modifiable risk factors for CAD. People with high cholesterol are twice as likely to develop heart disease as people with normal cholesterol levels are. Lipids are a group of fats and fat-like substances that are important constituents of cells and sources of energy. They contributes to a variety of functions in the body such as the production of hormones which are essential for growth and reproduction, the development of cells in tissues and organs throughout the body and the absorption of nutrients from the food you eat. Excess lipids can cause the buildup of plaques in the blood vessels. Plaques cause the narrowing or blockage of blood vessels which can lead to heart disease or events such as heart attack or stroke. So Monitoring and maintaining healthy lipid levels is important in staying healthy.

The lipid molecules may occur freely in the blood, although they are most often packaged and transported in protein complexes. There are three commonly known lipoproteins. Very low-density lipoproteins(VLDLs), consist primarily of triglycerides but will eventually become low density lipoproteins (LDLs). The main ingredient of LDLs is cholesterol, and high blood levels of LDL are associated with a higher risk of heart disease. In contrast to LDLs, High amount of HDLs in the blood stream is associated with a protective effect against the development of heart disease.

According to NCEP (National Cholesterol Education Programme) guidelines all patients at least 20 years of age should undergo lipid profile test. A lipid profile is a blood test that measures the different kinds of cholesterol found in the blood as well as triglycerides. It has been investigated extensively in recent years, which is found to be deranged in a large proportion of CAD patients especially in Asians showing a mixed picture of dyslipidemia.

NEED FOR THE STUDY

Coronary Artery Disease shows an escalation among the Indian population with a trend of reaching the younger age groups. A number of studies have been conducted time and again to find out the prevalence of CAD and it has been found that they have a widespread prevalence in India, with regional variations. It is now affecting almost all sections of the society from young to old and most affluent to least affluent. Statistics also show an increased prevalence of CAD in India as compared to other developing countries.

Large scale and widespread incidences show downgrading of the cardiovascular health status of Indians and emergence of CAD as a chronic manifestation across the population. Future trends predict that in the coming decade CADs will inflict every section of the population irrespective of age, gender, economic status. Owing to such a large rate of prevalence, India is set to lost on it is productive population on accounts of CAD mortality and morbidity hampering the advantage of a positive demographic transition. This affects the country's productivity owing to the disease related economic burden in an otherwise beneficial phase of demographic transition. The need of the hour is to track down and closely monitor the prevalence of disease and encounter it with better intervention policies aimed at prevention, control and treatment of CAD.

By 2020, the disease is forecasted to be the major cause of morbidity and mortality in most developing nations. In developing countries where the required medical and surgical interventions for CAD are inaccessible to the majority of the population,

disease prevention and health promotion strategies are critical. Early identification of risk factors in both men and women will be vital in curbing the growing CAD epidemic.

According to the projection by the **WHO** and **Indian Council of Medical Research,** India will not only be the capital of diabetes and hypertension but also the capital of heart attack by 2020. Hence, understanding the predominant risk factors like dyslipidemia among the Indian population is important. Furthermore, the South Asian population, especially that of the Indian subcontinent, is believed to have a higher risk and prevalence of CAD as compared with European and African population.

According to the **World Health Organisation**, Over 20% of the India's population suffers from at least one of the NCDs (Non Communicable Diseases),like heart disease and respiratory distress which would cost India an estimated US Dollars 6.2 trillion from 2012 to 2030, a government report said.

An ongoing study from **All India Institute of Medical Sciences (AIIMS) and Indian Council of Medical Research (ICMR)** has suggested that India's younger population (those under 30) is at great heart risk. The findings suggest 35 per cent of patients who had a heart attack are below 50 and 10 per cent are under 30. The rise in age-specific prevalence was highest in the youngest age group (35-44), noted the AIIMS study.

According to the **Inter Heart Study**, the median age for the first presentation of acute MI in South Asian 53 years whereas that it Western Europe, China and Hong Kong is 63 years. Studies carried out in India and other places suggest that Asians in general and Indians in particular are at increased risk of MI at a younger age (<40 years) irrespective of whether they have migrated to other countries or are resident Asians.

According to **Dr JPS Sawhney**, Chairman of the department of cardiology at the Sir Ganga Ram Hospital, one important cause of premature heart attack in India was familiar Hypercholesterolemia, a genetic condition that led to high cholesterol.

Dr. Sandeep Mishra said that in a recent study done in AIIMS, New Delhi, familial hypocholesterolemia was found to be the cause of premature heart attacks in around 25% of younger patients under the age of 40. Lifestyle modifications and controlling risk factors could help prevent this condition. Physical activity, a good diet and not taking stress or smoking were some of the factors that could help people ward off heart problems.

The **Global Burden of Diseases Study** reported that the disability-adjusted life years lost by CHD in India during 1990 was 5.6 million in men and 4.5 million in women; the projected figures for 2020 were 14.4 million and 7.7 million in men and women respectively.

Though the likely causes for the increase in the CVD rates include lifestyle changes associated with urbanization and the epidemiologic and nutritional transitions that accompany economic development, Dyslipidemia has been closely linked to the pathophysiology of CAD and is a key independent modifiable risk factor for CVD. While Asian Indians are known to have a unique pattern of dyslipidemia, there have been no large scale representative studies on dyslipidemia to assess the magnitude of the problem in india.

Estimation of the prevalence of dyslipidemia ensures proper plan of health actions for both primary and secondary prevention of CAD. For over two decades, lowering levels of LDL-C has formed the cornerstone of management of CAD patients. To bring about a primary prevention of CAD in adulthood, early detection and intervention for dyslipidemia must be done and blood lipid profile should be screened as early as possible to detect dyslipidemia and treatment should be directed towards adoption of healthy lifestyles.

A new national study done in India on **Novermber 2017** revealed that Punjab, Tamil Nadu, Haryana have highest Burden of Heart Disease in India. Ischemic heart disease–where blood supply to the heart is restricted–is the leading cause of death in India, causing 17.8% deaths in 2016, and the disease burden is increased 104% since 1990.

According to **Indian Heart Association**, **June 9, 2016**, 50% of all heart attacks in Indian men occur under 50 years of age and 25% of all heart attacks in Indian men occur under 40 years of age and the major risk factor is dyslipidemia.

A study done by **Ajay Raj 2016, Perunthurai district** in Tamilnadu revealed that there was a higher prevalence of dyslipidemia in urban(74.5%) than the rural (68.8%) but the difference was statistically not significant.

In a community based study conducted by **Shankar narayanan 2015** in the Departement of community medicine, Vinayaka mission, Salem, the total cholesterol, LDL-C, and VLDL-C were high among the subjects with high BMI when compared with normal BMI persons.

Jin et al 2015 from China, found the constant association between the severity of CAD and LDL cholesterol (LDL-C) in patients with severe disease condition.

Chauhan S et., al (2015) stated that CAD leads to increased economic burden at both national and household level. The amount spend for CAD patients results in lower non medical expenditure per person in the household.

Joshi et.al 2014 found that highest rates of hypercholesterolemia(18.3%) and highest rates of high LDL-C (15.8%) in Tamilnadu which calls for urgent lifestyle intervention strategies to prevent and manage this important cardiovascular risk factor.

Among the 33140 medically certified deaths reported to the **Register General of India** in 2014 by Telangana state, 18912 were due to heart disease and the number of deaths due to heart disease is also high in Andhra in November 2016.

On the other hand, in low and lower-middle countries such as India, where most of the CV and coronary heart disease (CHD) mortality occurs. In India, only limited number of large-scale studies exist on epidemiology of cholesterol and other lipid component.

Keeping these facts in mind the present study was undertaken to study the role of lipid profile in coronary artery disease patients. Every research advance brings us closer

to know the disease in a much better way and this in turn helps in narrowing the prevalence of particular disease. So, I, the investigator of this case control study on lipid profile and coronary artery disease will widen the understanding on issues.

STATEMENT OF THE PROBLEM

A case control study on lipid profile and risk level of Coronary Artery Disease among patients admitted in selected hospital, Madurai.

OBJECTIVES

- To assess the exposure rate of lipid profile and risk level of CAD among patients admitted in selected hospital
- To assess estimation of risk in lipid profile and risk level of CAD among patients admitted in selected hospital
- To find out the association between the Demographic variables and risk level of CAD among patients admitted in selected hospital

HYPOTHESIS:

H_1: There is a significance exposure rate of lipid profile and risk level of CAD among patients admitted in selected hospital.

H_2: There is significance estimated risk in lipid profile and CAD among patients admitted in selected hospital.

H_3: There is a significant association between the demographic variables and risk level of CAD among patients admitted in selected hospital.

OPERATIONAL DEFINITION

Case control study :

A case control study is a retrospective study that looks back in time to find the relative risk between a specific exposure and an outcome. In this study it refers to the relative risk between lipid profile and coronary artery disease among patients in selected hospital.

Lipid profile :

A Lipid profile is a pattern of lipids in the blood. It usually includes the level of total cholesterol, High density lipoprotein (HDL) cholesterol, triglycerides and low density lipoprotein cholesterol.

Risk :

It is the most likely consequence of a hazard, combined with the likelihood or probability of it occurring.

Coronary artery disease :

It refers to a group of disease which includes stable angina, unstable angina, myocardial infarction and sudden cardiac death.

Patients :

A person receiving or registered to receive medical treatment

Hospital :

An institution providing medical and surgical treatment and nursing care for sick or injured people.

ASSUMPTIONS

The study assumes that ;

- There is a relationship between lipid profile and coronary artery disease.
- Abnormal lipid profile may contribute to increased risk of coronary artery disease.
- Every individual will respond in a unique way to abnormal lipid profile.

DELIMITATIONS

The study is delimited to

- Patients present on the day of data collection
- Patients selected by non random method
- Patients aged between 26-75
- One hospital
- Study period was only five weeks

CONCEPTUAL FRAMEWORK

A concept is an abstract idea or normal image of phenomena or reality. Conceptualization is a process of forming idea which utilizes and forms conceptual frame work for development of research design.

A framework is a basic structure or outline of abstract. The present study aims to find out the effect to cause relationship between CAD and lipid profile among the patients admitted in Saravana Hospital, Narimedu, Madurai.

The conceptual framework based on **Betralanff's theory (1968)** the general system theory. According to **Ludwig Von Bertalanffy** the system acts as a whole. Dysfunction of a part causes system disturbances rather than loss of a single function. Whole system can be resolved into an aggregation of feedback circuits such as input, throughput and output. The feedback circuits help in the maintenance and improvement of an intact system.

In this theory the main focus is on the discrete parts and their interrelationship. "System" as a complex interaction, which means that systems consist of two or more converted elements, which interact with each other. The human being is a system that is composed of many elements, such as physiological, social, spiritual and cultural elements and a human being exchanges the energy, matter and information with its environment constantly, as well as within its body to maintain life and health. All system containing the following elements.

Input is matter, energy and information received from the environment. Throughput is matter, energy, and information that is modified or transformed within the system. Output is matter, energy and information that is released from the system into the environment. Feedback is information regarding environmental responses used by the system. It may be positive or negative or at times it may be neutral.

In this study **Input** is considered as the lipids obtained from food sources of fat such as cooking oils, butter and animal fat. If the humans eat more calories than they burn or eat too much of food rich in fates, triglyceride level could become too high and pose a health risk. Cholesterol the most abundant steroid lipid in the body is produced by the liver in adequate amount and consuming it through the food, it becomes excess and it combined with other compounds in humans blood, it can build up as plaque in arteries and blocking blood flow to and from the heart. LDL, or low density lipo protein and

HDL, High density lipo protein are the two types of cholesterol. Having a high cholesterol level increase the risk of cardio vascular disease.

Throughput refers to the process by which the system processes input and release an output. In this study the throughput considered for processing the input is lipid profile test which is otherwise called as complete cholesterol test or lipid panel test which is combination of tests that help in checking the present of abnormal cholesterol levels and related lipid components.

According to systems theory **Feedback** refers to **Output** that is returned to the system that allows it to monitor itself overtime in an attempt to move closer to a steady state known as equilibrium or homeostasis. Feedback may be positive, negative or neutral. For the present study "feedback" is coronary artery disease and the humans will get it when they have abnormal lipid profile as there is interrelation and interaction existed among elements of a system and changes in one part of system will create changes in other parts.

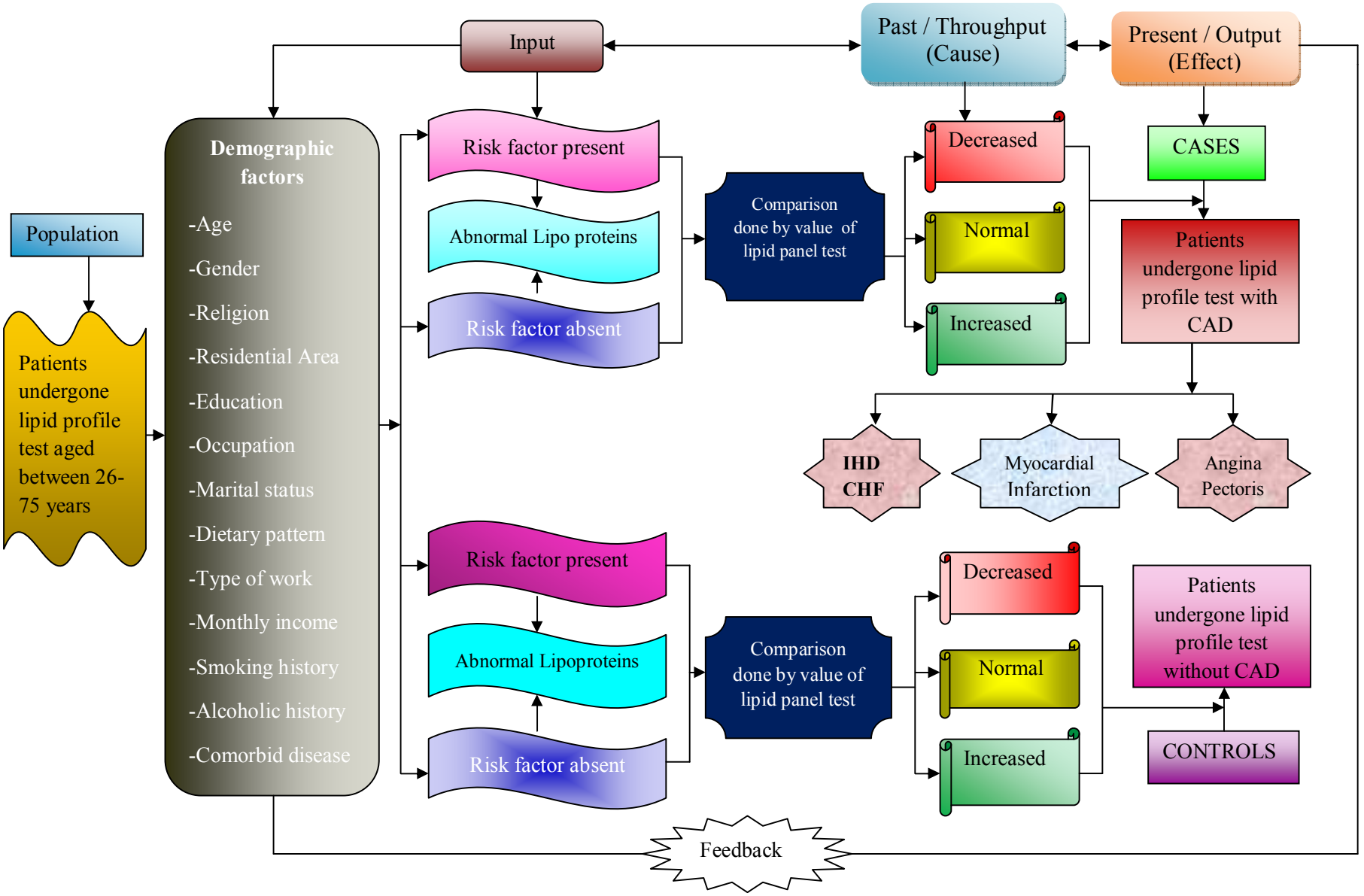

Fig 1 : CONCEPTUAL FRAMEWORK BASED ON GENERAL SYSTEM THEORY

CHAPTER – II

REVIEW OF LITERATURE

Review of literature is an important step in the development of a research project. It involves the systematic identification of location, scrutiny and summary of written materials that contain information on research problem.

" The literature is reviewed to summarize knowledge for use in practice or to provide a basis for conducting study".

-Nancy Burns 2002

"A Literature review is an account of what has been already established or published on a particular research topic by accredited scholars and researchers."

-University of Toranto, 2001

This chapter attempts to preset a broad review of the studies conducted, the methodology adopted and conclusion drawn by earlier investigation, it helps to study the problem in depth. The literature reviewed for the present had been presented under the following heading :

a) **Studies related to prevalence of CAD and its risk factors**
b) **Studies related to prevalence of dyslipidemia in CAD**
c) **Studies related to lipid profile and severity of CAD**
d) **Studies related to association between demographic variables and CAD**

a) Studies related to prevalence of coronary artery disease and its risk factors

Sharma et.,al (2017) conducted a case control research design to determine the prevalence of CAD risk factors among the female population in Nepal at tertiary cardiac centre of Kathmandu. 52 study participants identified with CAD were matched for age

with 52 controls selected by Convenient sampling. Data was collected by administering questionnaire and blood samples were drawn for lipid profile. Data was analysed by using frequency tables and Pearson's Chi – square test and Binary logistic regression. The study found that there was a significant association between CAD and ethnicity, smoking, harmful use of alcohol, moderate physical activity, family history of CAD and total cholesterol. Alcohol intake and LDL-C, DM, BMI is equal or more than 27.5 kg/m^2 were found as significant predictors of CAD. The study recommended that further research in women in developing countries will be key, giving the rising levels of risk factors and morbidity rates in female population.

M. N. Krishnan et.,al (2016) conducted a community-based cross-sectional study on Prevalence of coronary artery disease and its risk factors in Kerala, South India**.** 5167 adults were selected using a multistage cluster sampling method. Information on socio-demographics, and CAD was collected using a structured interview schedule. Anthropometry, blood pressure, electrocardiogram, and biochemical investigations were done using standard protocols. SPSS version 17 was used for analysis. The overall age-adjusted prevalence of definite CAD was 3.5 %: men 4.8 %, women 2.6 % ($p < 0.001$). The prevalence of definite CAD in Kerala increased nearly three times since 1993 without any difference in urban and rural areas. Most risk factors of CAD were highly prevalent in the state. The study recommended that Both population and individual level approaches to address the high level of CAD risk factors to reduce the increasing prevalence of CAD in this population.

Syed M.Atique (2016) conducted a prospective cohort study at the Canberra hospital in Australia among 2137 consecutive patients to find out the association between BMI and CAD. Data was collected from patient's medical records and analysed by using chi square test and continuous variables were analysed by student t test or wilcoxon rank-sum test. Multivariate logistic regression analysis was performed to investigate the effect of BMI on CAD. 43.6% were overweight (BMI 25-29.9 kg/m^2) and 31.6% were obese (BMI >30 kg/m^2). The study found that obesity is an independent risk factor for earlier age of presentation with CAD and there is a strong linear association between increasing

BMI with mean age of presentation and this association was equally strong in men and women.

Yan Zhang et.,al (2015) conducted a cross sectional study to evaluate current lipid profile in nontreated Chinese patients with coronary artery disease and to assess the prevalence of CAD in Fu Wai hospital and National Center for Cardiovascular Disease, Beijing, China. A total of 1772 consecutive, clinically suspected CAD patients were enrolled with angiography and lipid lowering therapy. Of which 1057 were diagnosed as CAD. Data was collected by clinical examination and bio physical profile. Mean, SD, The Mann-Whitney U test and Kruskal Wallis H test, Chi square test, Univariate and multivariate logistic regression were used for analysis. The study showed that lipid in CAD were TG 1.78, Total Cholesterol 4.92$\pm$0.99 and HDL 1.09$\pm$0.29, LDL 3.22$\pm$0.91 mmol/l. The study found that the prevalence of CAD was more detectable in men than women and higher prevalence of CAD in men than women. The study cocncluded that cholesterol levels were increasing in Chinese nontreated CAD patients.

T.Sekhri et.,al (2015) conducted a study to assess the prevalence of risk factors for coronary artery disease in government employees across India. 10642 men and 1966 women aged between 20-60 from 20 cities across 14 states were selected to participate in the study by using multistage cluster sampling. Data was collected by using detailed questionnaire, medical examinations and anthropometric measurements, blood samples for lipid profile and blood glucose and resting ECG. The study revealed that 4.6% of the study population had a family history of CAD and the prevalence of diabetes and hypertension were 16% and 21%. Prevalence of dyslipidemia was 45.6%. Overall, 78.6% subjects had two or more risk factors for CAD. The study recommended that there is a immediate need to initiate measures to raise awareness of these risk factors so that individuals at high risk for future CAD can be managed.

Gonzalez-pacheco et.,al (2014) conducted a cross sectional study to determine the prevalence of conventional risk factors and the lipid profile among 3447 consecutive patients with ACS and significant CAD. Information regarding risk factors was gathered

from the database of the coronary care unit of the National Institure of Cardiology in Mexico city from October 2005-June 2012. Blood samples drawn for lipid profile. SPSS 13 was used for analysis. The most frequent risk factor was smoking, which was present in 68% of patients, followed by hypertension (57.8%), dyslipidemia (47.5%) and diabetes (37.7%). In women, the most frequent risk factors were hypertension, diabetes and dyslipidemia whereas in men smoking was the most frequent. The lipid profile analysis revealed that 85.1% of patients had some type of dyslipidemia and the most frequent was low levels of high density lipoprotein cholesterol(68.6%). The study found that atleast one conventional risk factor in 95.7% of patients with ACS and significant CAD and the lipid profile revealed that two thirds of cases had low high density lipoprotein cholesterol levels.

Sushma Nair (2014) conducted a prospective case control study to assess the prevalence of CAD and to study the risk factors in a semi urban area of Tamilnadu. 50 samples were selected as controls and 50 were selected as cases by purposive sampling technique. Data was collected by structured questionnaire and blood samples were taken to find out blood glucose and blood cholesterol. Statistical analysis was done by using SPSS version 21. The study found that the prevalence of CAD increased with increasing age. CAD was found more frequently in men, diabetics and hypertension and dyslipedemia, obesity, sedentary lifestyle and alcohol ingestion all proved to be statistically significant risk factors for CAD.

Vinod Joseph Abraham et.,al (2013) conducted a cross sectional study to assess the prevalence of heart disease and risk factors for CHD in urban and rural Vellore, Tamilnadu and to compare the current (2010-2012) prevalence with the prevalence of CHD in the same areas in 1991-1994. Participants were aged between 30-64 selected by Multi stage cluster sampling. Rose angina questionnaire and resting ECG was used to collect the data. Data was analysed by SPSS version 18. The prevalence of CHD was 3.4% (95% CI: 1.6–5.2%) among rural men, 7.4% (95% CI: 4.7–10.1%) among rural women, 7.3% (95% CI: 5.7–8.9%) among urban men, and 13.4% (95% CI: 11.2–15.6%) among urban women. The age-adjusted prevalence in rural women tripled and in urban

women doubled, with only a slight increase among males, between 1991–1994 and 2010–2012. The study concluded that prevalence of CHD is increased among both pre and post menopausal females and suggested the need for further confirmatory studies and interventions for prevention of CHD in both rural and urban areas.

Amitesh Agarwal et.,al (2012) conducted a single centre retrospective case control study among 292 patients aged more than 40 years with CAD to establish the association of modifiable risk factors of CAD and to identify the association of cutaneous markers like premature greying of hair and premature baldness and arcus juvenilis in both males and females in Guru Teg Bhadur Hospital, New Delhi. 92 were used as controls. Data was collected by using interview method and biophysical profile. SPSS version 17 used for data analysis. The study found that Dyslipidemia (91%), smoking (74.3%),Low HDL-C (68.9%), Central obesity (47.7%)and graying of Hair (34.9%) were the most commonly associated factors with CAD. And the study showed that females has greater prevalence of dyslipidemia, Low HDL-C, Obesity, HT,DM and family history of premature CAD when compared with males. The presence of cutaneous markers was also significantly associated with premature CAD.

Cyril James (2012) done a cross sectional study to analyse the major risk factors for coronary artery disease among 496 patients with ischemic heart admitted in Lourdes Heart Institute and Neuro center, Cochin, Kerala selected by purposive sampling method. Data was collected from patients and their old medical records, clinical examination and laboratory results. The study revealed that Keralites irrespective of gender, diabetes or impaired glucose tolerance (79%), dyslipidemia (71%) are the major risk factor for CAD. HT(39%) and cigarette smoking (24%)were not seen to be a major risk factors for CAD as only a minority of the study population given the history of HT and smoking. It showed that among south Indian population irrespective of gender, DM and dyslipidemia are the major risk factor for CAD. So the study recommended that early detection of DM and dyslipidemia and proper treatment of both play a vital role in the prevention of CAD.

M Sadeghi MD, (2012) conducted a cross sectional study on prevalence of CAD among 6498 people aged above 35 yrs, selected by using multi stage cluster sampling in the provincial cities of Isfahan. 3338 women and 3160 men participated in the study. Data was collected by Rose angina questionnaire and analysed by SPSS version 13. The prevalence of CAD based on the Rose questionnaire and Minnesota coding was 37.5% in women and 22.2% in men. The study showed that prevalence of definite possible MI based on ECG was higher in men, however a higher prevalence of possible and definite ischemia was found in women.

Dakshina Murthy. P et.,al (2010) conducted a cross sectional community based study to assess the prevalence of CAD and its Risk Factors in an Urban Population of Andhra Pradesh. A randomly selected 534 people aged 20 years and above were examined. All of them underwent oral glucose tolerance test, lipid profile and a 12-lead electrocardiogram. CAD was diagnosed based on previous medical history and coronary intervention procedures or Minnesota coding of ECGs. The overall prevalence rate of CAD was 5.4% (age standardized prevalence rate = 5.1%). The prevalence rate of CAD were 3.0%, 23.5% and 11.3% in persons with normal glucose tolerance, impaired glucose tolerance and diabetes mellitus respectively. Prevalence of CAD increased with an increased total cholesterol. Study indicated that prevalence of CAD in urban Andhra Pradesh is alarmingly high as observed in other parts of India and urgent steps are to be taken to adopt life style changes to control risk factors.

Viswanathan Mohan (2009) done a cross sectional study to assess the prevalence of CAD and its relationship to lipids in a selected population in South India. Of the total of 1,399 eligible subjects 1,262 (90.2%) participated in the study from two residential areas of Chennai town. All the study subjects underwent a glucose tolerance test and Twelve-lead electrocardiogram (ECG) was performed in 1,175 individuals (84%). CAD was diagnosed based on previous medical history or Minnesota coding of ECGs. The overall prevalence rate of CAD is 11.0% (age standardized, 9.0%). The prevalence rates of CAD were 9.1%, 14.9% and 21.4% in those with NGT, IGT and

diabetes, respectively. The prevalence of CAD is rising rapidly in urban India and the study strongly recommended lifestyle changes and aggressive control of risk factors to reverse this trend.

b) Studies related to prevalence of dyslipidemia in CAD

Vicky Jocelyne Ama Moor (2016) conducted a cross sectional study to determine the frequency of lipid abnormalities in patients with a cardiovascular risk and disease at the University Teaching Hospital of Yaounde. They recruited 264 consecutive patients of which 119 were men and 145 were women. Participants were asked to answer a questionnaire after taking blood samples. SPSS version 18 was used for analysis. The study findings were as follows : Low HDL cholesterol(44.3%), Hypertriglyceridemia(18.9%). High LDL cholesterol(3.8%) and high total cholesterol (3.4%). The study concluded that low levels of HDL cholesterol and Hypertriglyceridemia are more prevalent in study population and they recommended for further studies to confirm this finding in the study environment.

Mainul Haque et.,al (2016) done a cross sectional descriptive study among 160 consecutively selected CHD patients aged between 30-79 years to demonstrate the patterns of lipid profile in the selected hospital, Malasia. Patients were asked to fill up the questionnaire after taking blood samples. SPSS version 17 was used or analysis. The study revealed that most of the CHD patients had the total cholesterol level high, and among them 25.6% were malay. Most of the CHD patients had the TG level within normal range but among them 19.9% were Malays. This study had demonstrated that Malays were mostly affected by Heart disease followed by Chinese and Indians and the incidence was twice as high as in men compare to women. This study indicated that high serum cholesterol is an important single risk factor for CHD and an increase in the levels of LDL-Cholesterol and a decrease in HDL-Cholesterol especially among the males and in Malays.

Ajay Raj (2016) conducted a descriptive cross sectional study done among randomly selected adults more than 30 years of age to determine lipid levels and to compare the lipid levels and prevalence of dyslipidemia in a rural and urban community in Tamilnadu. The study included included Interview schedule, anthropometry, blood pressure measurement and fasting lipid profile on 325 subjects of whom 165 and 160 belong to urban and rural population respectively. SPSS 18 used for analysis. The study revealed higher prevalence of dyslipidemia, which was marginally higher in the urban (74.5%) than the rural (68.8%) area but the difference was statistically not significant. The extent of high total cholesterol, LDL-C,triglycerides were marginally higher in urban area and there was a linear association between the prevalence of dyslipidemia, age and body mass index. The study concluded that awareness programmes on desirable diet and regular screening of population on periodic basis should be incorporated at the primary health care level.

Nijaguna et.,al (2015) conducted a community based cross sectional study to determine the prevalence of dyslipidemia in 440 children aged between 10 to 16 years from three schools of South Bangalore selected by multi stage cluster sampling. Detailed history was taken with systematically designed proforma and blood samples were analyzed for lipid profile. SPSS version 21 was used to analyze the data. The mean TC (129.59), HDL-C (38.49mg/dl). LDL-C (71.6mg/dl) and non HDL-C(91.3mg/dl) were significantly lower but TG was (97.34mg/dl) higher than studies from western countries. The study found that there was no significant increase in overall prevalence of dyslipidemia in these children and the prevalence of hypercholesterolemia were 0.68% (high) and 5% (borderline). The study concluded that there was a need for further studies to evaluate the lower lipoprotein values observed in this study to facilitate appropriate cut off levels and to study the future occurrence of dyslipedic status in children having various risk factors.

Aachu Agrawal (2015) conducted a house to house survey to investigate lipid profile and prevalence of dyslipidemia among 501 urban women aged between 35-70 at Jaipur district, Rajasthan, India. A general questionnaire was administered to gather

background information and fasting blood samples were collected to determine lipids. SPSS version 20 was used for analysis. Population mean levels of TC, LDL-C, HDL-C and TGs were 183.9±15.3, 111.8±18.0, 44.0±6.2 and 140.6±30.9 mg/dl respectively. Of a total of 500 subjects, 13.8% had TC=200 mg/dl, 12.6% had 150 mg/dl, 85.4% had HDL-C <50 mg/dl and 23% had TG 150 mg/dl. An increase in serum lipids was most prominent in the 40-59 year age group. The study observed that prevalence of low HDL-C was very high among the subjects.

Dr.Jayita Dasgupta et.,al (2015) conducted a prospective case control study to assess the lipid in patients of coronary artery disease among rural population of Bihar. 100 consecutive cases diagnosed as CAD aged between 30-90 years were compared to 50 age and sex matched healthy controls. Structured Questionnaire was used to collect the personal details and blood samples drawn for lipid profile test. SPSS version 17.5 was used for analysis. The total cholesterol levels (mean±SD values) ranged between 221.94±32.03 to 195.20±37.28 in different age groups of cases and these values were significantly high compared to the CHO levels in corresponding age groups of controls (p=0.006) except in the age groups of < 40 years. Except in the age groups of < 40 years the triglyceride levels were significantly high in all the other age groups of cases compared to control groups(p=0.008) The HDL cholesterol levels were significantly low in all age groups of cases except in <40 years age group compared to the levels in control groups (p=0.0114). The mean LDL cholesterol levels were not significantly different in any of the age groups compared to the levels in control groups (p=0.219). The study showed that high serum cholesterol and triglyceride and low HDL cholesterol are clinically significant in all the age groups above 40 years. Mean and SD levels of four biochemical parameters except LDL were statistically significant between cases and controls. The study recommended that early detection of abnormal lipid profile and its proper management by lifestyle modification.

Joshi SR et.,al (2014) conducted a study to study the pattern and prevalence of dyslipidemia in a large representative sample of four regions Tamilnadu, Maharashtra, Jharkhand, Chandigarh in India. Among 213 million people stratified by multistage

sampling to recruit individuals ≥20 years of age. All the study subjects (n=16,607) underwent anthropometric measurements and oral glucose tolerance tests were done. In addition, every 5th subject (n=2042) undergone lipid profile. Of the subjects studied, 13.9% had hypercholesterolemia, 29.5% had hypertriglyceridemia, 72.3% had low HDL-C, 11.8% had high LDL-C levels and 79% had abnormalities in one of the lipid parameters. Regional disparity exists with the highest rates of hypercholesterolemia observed in Tamilnadu (18.3%), highest rates of hypertriglyceridemia in Chandigarh (38.6%), highest rates of low HDL-C in Jharkhand (76.8%) and highest rates of high LDL-C in Tamilnadu (15.8%). Except for low HDL-C and in the state of Maharashtra, in all other states, urban residents had the highest prevalence of lipid abnormalities compared to rural residents. Low HDL-C was the most common lipid abnormality (72.3%) in all the four regions studied. The study concluded that dyslipidemia was very high in India, which calls for urgent lifestyle intervention strategies to prevent and manage this important cardiovascular risk factor.

Haddah FH et.,al (2014) conducted a retrospective case control study to determine the lipid profile and to identify and stratify risk factors in diabetic and non-diabetic patients with proven coronary artery disease at King Hussein Medical Center, Amman,Jordan. 192 (77 diabetics and 115 non diabetics) participants were consecutively selected and undergone lipid profile test. SPSS version 17 was used to analyse the data. The mean (+/- standard deviation) plasma cholesterol for the group with CAD is 231.43 +/- 57.99 mg/dl Vs 202.8 +/- 36.58 in the control group ($p<0.0003$). High density lipoprotein 35.98 +/- 9.37 Vs 44.43 +/- 8.34 ($p=0.00011$). Low density lipoprotein 146.75 +/- 50.93 Vs 118.97 +/- 45.9 ($p=0.003$). Triglyceride level 246.95 +/- 142.1 Vs 164 mg/l +/- 93.78 ($p=0.0002$). The prevalence of high plasma cholesterol, triglycerides (TG), LDL-C and low HDL-C was 60.9%, 68.3%, 63.5% and 48.4%. The study concluded that Hyperlipidemia remains the strongest risk factor for CAD and Diabetic females are at higher risk for CAD versus non-diabetics with the same lipid profile.

Namita (2014) conducted a study to evaluate the lipid abnormalities and correlation with traditional and non-traditional risk factors in known subjects with CAD.

Sample size was 300. Consecutive sampling was used to select the participants. Among them 216 were females and 84 were males. Data was collected by evaluating anthropometric measurements and blood samples were collected for biochemical and inflammatory markers. SPSS version 20 used for analysis. The study found that hypercholesterolemia, hypertriglyceridemia and low high density lipoprotein was present in 23.3%, 63% and 54.6%. The study concluded that hypertriglyceridemia and low HDL cholesterol is common in patients with CAD compared with hypercholesterolemia. The study suggested that different preventive strategy is required in Indian patients with CAD.

Manurung D (2006) conducted a study to see which component of the triad lipid that has more important role and frequently found in patients with ACS, focusing on HDL cholesterol. 391 consecutively selected patients with ACS, hospitalized in ICCU of Cipto Mangunkusumo Hospital in China taken as participants. Blood samples drawn to collect the data and analysed by appropriate statisitical package. There were 260 patients with atherogenic lipid profile (64%), 135 patients with borderline lipid profile (34.5%), and optimal lipid profile was found only in 6 patients (1,5%). The mean value of HDL cholesterol level in male patients was 41.75 mg/dl +/- 9.9, while HDL cholesterol level in female patients was 46.16 mg/dl +/- 10.74. The study concluded that atherogenic lipid profile is more common risk factor in ACS patients than in other non lipid risk factors and it demonstrated that this lipid is most commonly found in patient with low HDL cholesterol and it is least frequently found in patient with optimal lipid profile.

c) Studies related to lipid profile and severity of Coronary Artery Disease

Cenk conkbayir (2015) conducted a cross sectional study to reveal the relationship between lipid quartiles and the extent and severity of CAD in Iceland Cyprus. A total of 412 consecutive non diabetic patients with suspected CAD gave their consent to participate in the study. Coronary angiography was performed and multiple views were recorded for all the patients. Demographic profile was collected by

administering questionnaire. The Friesinger index is used to assess the severity of CAD. SPSS version 13 was used for analysis. Of the total 412 patients, 44 patients had no coronary lesions, and the remaining 368 patients had CAD that ranged from irregularities to total occlusions. The mean (SD) Friesinger index was 6.9 (4.4), and 59.0% of the patients belonged to a Friesinger index category of ≥5. Hypertension (75.8%), low HDL-C levels (<40 mg/dL, 63.6%) and hypercholesterolemia (62.6%) were the leading comorbidities. The study found that there is a significant relationship between lipid quartiles and the extent and severity off CAD and it recommended that TG/HDL ratio should be used to measure disease severity as it is easy, and economical method of discerning the extent of CAD.

Rafaela Andrade Penalva et., al (2006) conducted a retrospective case control study to evaluate the relationship between CAD and dyslipidemia in acute coronary syndrome without ST segment elevation at Hospital Santa Izabel, Brazil. 107 consecutive patients diagnosed with ACS(Acute Coronary Syndrome) without ST segment elevation undergone coronary angiography selected as participants. Serum level of lipid fractions was assessed. Severity of CAD was determined by evaluating the number, degree and score of coronary artery obstructions. SPSS version 13 used for analysis. 94(88%) had CAD, of which 50 (53.2%) were males with predominance of multivessel disease. As regards the lipid profile, 64(59.8%) patients were observed to have TC<200mg/dl, 33(30.8%) had HDL<40mg/dl, and 38(35.5%) had LDL<100mg/dl. The analysis of coronary angiographies showed that 94(88%) patients had CAD, and 84% had > 70% stenosis. They observed a higher TC/HDL ratio in the multivessel and two-vessel groups in comparison with the one-vessel group (4.3±2, 4.0±1.7, 2.9±1.6, respectively. The study concluded that TC/HDL ratio was a marker of severity of CAD in relation to the number of vessels affected thusby demonstrate that the lipid profile can be a determinant of severity in patients with ACS without ST segment elevation.

d)Studies related to association between demographic variables and coronary artery disease

William M.. Schultz et., al (2017) conducted a prospective cohort(inception period 2003-2015) of randomly selected 6051 patients undergone cardiac catheterization for suspected or confirmed CAD to assess the relationship between marital status and CAD in Washington. Mean, SD, student T test, 1 way ANOVA and chi square test, Mann-Whiteny test was used for analysis. The relationship between marital status and primary outcome of CVD and MI was examined using Cox regression models. There were 1085 (18%) deaths from all causes, 688(11%) CV related deaths, and 272(4.5%) incident MI events. Compared with married participants, being unmarried was associated with higher risk of all cause mortality, CV death or MI. Compared with married participants, the incidence cardio vascular death or MI was similar for the participants who were divorced or separated, widowed or never married. Based on the findings marital status is independently associated with cardiovascular outcomes in patients with or at high risk of cardiovascular disease, with higher mortality in unmarried population.

Peter Smith (2016) conducted a prospective cohort study to examine the relationship between occupation that require predominantly sitting and those that require predominantly standing and incident heart disease among 7320 Canadians. Incident of heart disease was assessed using administrative records over an approximately 12 year follow up period (2003-2015). Data was analysed by appropriate statistical analysis methods. The study found that occupation involving predominatly standing were associated with an approximately 2 fold risk of heart disease compared with occupations involving predominantly sitting. Cardiovascular risk associated with occupation that involve combinations of sitting, standing, and walking differed for men and women, with these occupations associated with lower cardiovascular risk estimates among men but elevated risk estimates among women.

Yang Yang et.al (2016) conducted a prospective cohort study to examine the relationship between alcohol consumption and CAD and to observe a non linear

association between alcohol consumption and risk of CAD and consumption of 36g/dl of alcohol conferred a lower risk than other levels in Nanjing Medical University, China. Data was collected from pubmed database. The meta analysis included 18 prospective studies with a total of 214340 participants and 7756 CAD cases. The study observed a non linear association between alcohol consumption and risk of CAD. Compared with non drinkers the RRs (95% CI) of CAD across levels of alcohol consumption were 0.75(0.70-0.80) for 12 g/d, 0.69(0.64-0,75) for 36 g/d, 0.70(0.64-0.77)for 60g/d, 0.74(0.67-0.83)for 90g/d and 0.83(0.67-1.04) for 135 g/d. The study concluded that alcohol consumption in moderation is associated with a reduced risk of CAD with 36 g/d of alcohol conferring a lower risk than other levels.

Kurd BJ (2014) conducted a retrospective case control study to find out the relationship between stress and CAD among 60 patients with coronary artery disease admitted to the Civil Hospital Karachi, Pakistan. Purposive sampling technique was used to select the participants. A semi structured questionnaire consist of questions regarding personal information and stress evaluation scale is administered to collect the data. SPSS version 16 was used to analyse the data. Analysis showed 60% of the patients with high stress (p=0.025) and 36.7% moderate stress (p=0.0025). The study found that stress of varying degrees is a significant risk factor in patients with CAD and there is a association between stress and patient age, sex, body mass index and blood group.

Krithiga Shridhar et.,al (2014) conducted a study to evaluate the association between vegetarian diets and CVD risk factors across four region of India. Study participants included urban migrants, their rural siblings and urban residents of the Indian Migration Study from Lucknow, Nagpur, Hyderabad and Bangalore (n=6555, mean age-40.9 yrs). Information on diet (validated interviewer-administered semi-quantitative food frequency questionnaire), tobacco, alcohol, physical history, medical history, as well as blood pressure, fasting blood and anthropometric measurements were collected. Using robust standard error multivariate linear regression models used for analysis. Vegetarians had a higher standard of living and In multivariate analysis, vegetarians had lower levels of total cholesterol (β=−0.1 mmol/L (95% CI: −0.03 to −0.2), p=0.006), triglycerides

(β=−0.05 mmol/L (95% CI: −0.007 to −0.01), p=0.02), LDL (β=−0.06 mmol/L (95% CI: −0.005 to −0.1), p=0.03) and lower DBP (β=−0.7 mmHg (95% CI: −1.2 to −0.07), p=0.02). Vegetarians also had decreases in SBP (β=−0.9 mmHg (95% CI: −1.9 to 0.08), p=0.07) and FBG level (β=−0.07 mmol/L (95% CI: −0.2 to 0.01), p=0.09) when compared to non-vegetarians. The study concluded that there was a beneficial association of vegetarian diet with CVD risk actors compared non vegetarian diet.

Mark Woodward et.,al (2012) done a prospective cohort study to compare the association between low socio economic status and CAD among Asian and Australian population. 303036 (71% from Asia) from 24 studies in the Asia Pacific Cohort Studies collaboration were selected as participants. Cox regression model is used to estimate the relationship between educational attainment and CVD (fatal or non fatal), as well as all cause mortality. 11065 death 3655 from CVD and 1809 CVD non fatal events were recorded. Adjusting for classical CVD risk factors for primary relative to tertiary education in Asia(Australia) were 1.81 (,2.36) (1.10 (1.22) for all cause mortality, 2.47(4.17)(1.24(1.51) for CVD mortality and 2.09(3.26)(1.23(1.46) for all CVD. The study concluded that low educational attainment is associated with a higher risk of CVD or premature mortality in Asia, to a degree exceeding that in the western population of Australia.

T.Hardarson (2001) conducted a epidemiological study to assess the educational level and coronary artery disease mortality and all cause mortality at Icelandic heart association, Reykjavik, Iceland. 18912 participants aged between 33-81 years selected by multi stage cluster sampling followed up or 4-30 years. They were divided into four groups according to education and the standard risk factors were assessed on entry and mortality and cause of death registered during follow-up. Multiple Cox regression analysis was applied to assess the relationship between age at examination and year at examination and educational level and mortality. For men, 14%(95% CI:2-24)was found in CAD mortality for those having high school education relative to elementary school. The figures for junior college and university education were 17%(95% CI:1-31) and 38%(95% CI:22-32). For women 34% reduction was found in CAD mortality for high

school education and 55% for junior college but two few had university education for reliable results. The study found that CAD mortality was significantly related to education and it concluded that education is a strong protective factor both for CAD mortality and all cause mortality.

CHAPTER III

RESEARCH METHODOLOGY

Methodology is a significant part of any research which enables the researcher to organize the procedure of collecting reliable data for the problem under study or investigation. This chapter deals with the description of methodology and the various steps adopted to collect and organize data for the study.

According to **Polit and Beck (2004**) research methods are the techniques used by the researcher to structure a study to gather and analyze information relevant to research question.

The methodology section includes the research approach, research design, variables, settings, population, sample, sample size, sampling technique, sampling criteria, development of the tool, description of the tool, validity, reliability, pilot study, data collection procedure, plan for analysis and ethical consideration.

RESEARCH APPROACH

According to **Suresh K. Sharma (2011**) the research approach involves the description of the plan to investigate the phenomenon under study in a quantitative, qualitative or a combination of the two methods. Furthermore, it helps to decide whether the presence or absence as well as manipulation and control over variables.

The present study is a retrospective case control study. It is a study that compares who have a disease or outcomes of interest (cases) with patients and who do not have the disease or outcome (controls) and looks back retrospectively to determine the exposure to the risk factor of interest from each of the two groups of individuals: Cases and Controls. It is also knows as case referent studies.

The ultimate aim of present study is to assess lipid profile and risk level of CAD among the selected participants admitted in Saravana Hospital, Madurai.

RESEARCH DESIGN

According to **Kothari,** a research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.

SCHEMATIC PRESENTATION OF RESEARCH DESIGN

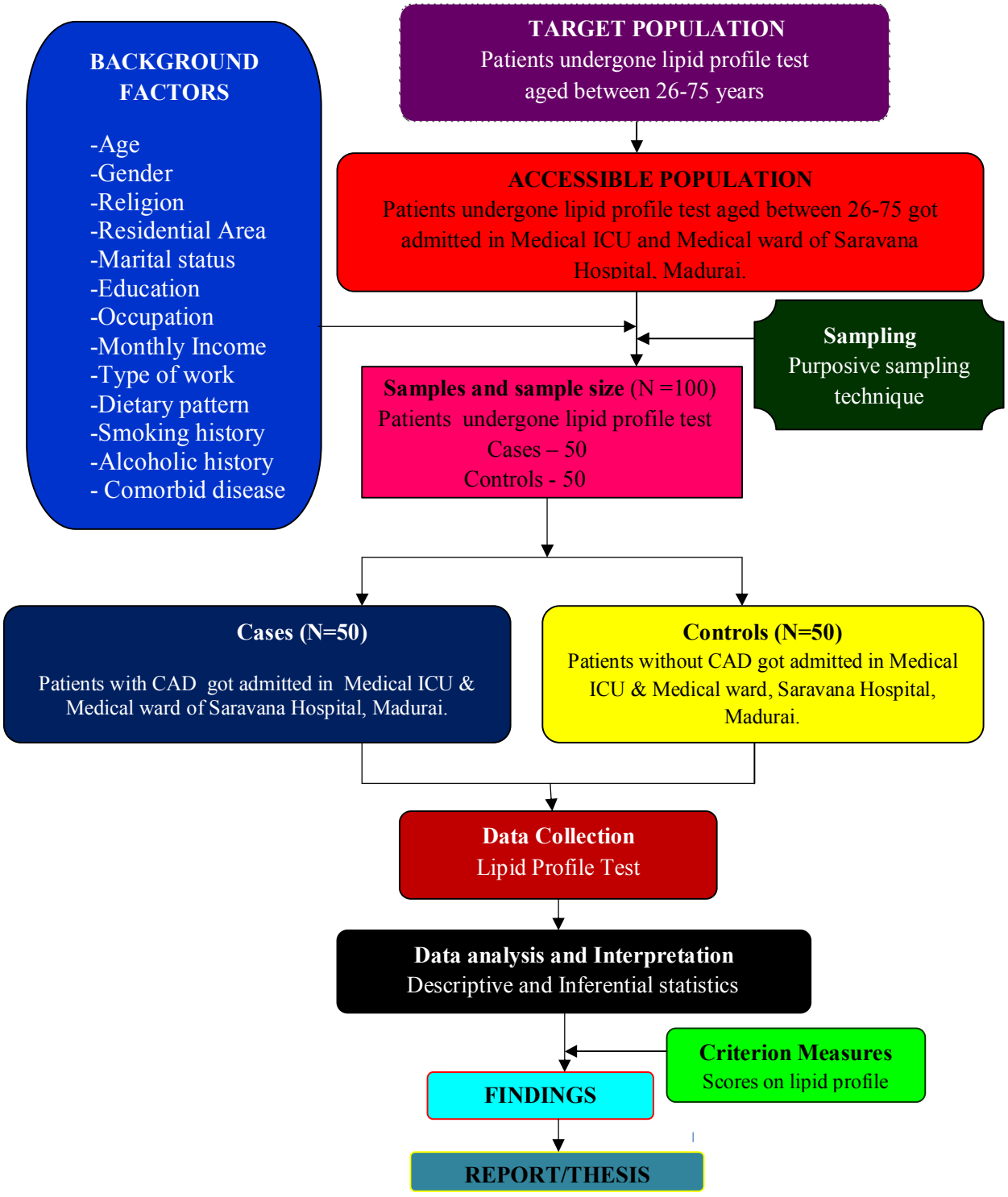

FIG 2 : SCHEMATIC PRESENTATION OF RESEARCH DESIGN

VARIABLES

Variables are qualities, properties or characterisitics of person, things, or situation that change or vary.

Chinn and Kramer stated that "Variables are concepts at different level of abstracts that are concisely defined to promote their measurement or manipulation within study". Variables are classified as Independent and dependent variable, Research variable, Demographic variable and Extraneous variable. The variable mainly included in the study are dependent variable and independent variable.

Dependent Variable :

The dependant variable is the variable that the researcher is interested in understanding, explaining and predicting. It is free to change over a range of different experimental treatments. The dependent variable is what we measure in the experiment and what is affected during the experiment. It depends on the independent variable.

In this study, the dependent variable was CAD.

Independent variable :

The independent variable is assumed to cause or influence the dependent variable or outcome. The independent variable is manipulated in experimental research to observe its effect on the dependent variable. It is sometimes referred as the treatment variable.

In this study the independent variable was Lipid profile test..

Demographic variables :

In most of the studies, researchers make the attempt to study the sample characteristics and present them in research findings. In addition, sometimes researchers even try to establish relationship between demographic variables and research variables.

In this study the selected demographic variables to which the investigator tries to establish relationship are Age, Gender, Religion, Residential Area, Marital status,

Education, Occupation, Type of work, Monthly Income, Dietary pattern, Smoking history, Alcohol history, Comorbid disease.

RESEARCH SETTING

According to **Polit and Hunger (2002**) selection of the setting should be done on the basis of the availability of subjects, co-operation from the authorities and feasibility of time, money and the material.

Based on the availability of samples, acquaintance of the investigator with the area and the cooperation from the Institution Saravana Hospital was selected for the study. This hospital is located in Narimedu, Madurai which is 3-5 kilometres away from Government Rajaji Hospital, Madurai. It is a 150 bedded multispeciality hospital having a separate wing for the patients having cardiac problems. It has a 6 bedded ICU and the medical ward consists of 33 beds.

POPULATION

According **to Nirmala. V.** Population is referred as the totality or aggregate of elements showing some common set of criteria. It includes anything in totality. Population are of two types : Target population, Accessible population.

Target population :

It refers to the population under study and the population to which the researcher wants to generalize the research findings. The target population of this study was the patients undergone lipid profile test aged between 26-75.

Accessible population:

It refers to the part of the population that is available to the research. The accessible population in the study were the patients undergone lipid profile test aged

between 26-75 got admitted in Medical ICU and Medical Ward, Saravana Hospital, Narimedu, Madurai.

SAMPLE AND SAMPLE SIZE

Polit and Beck (2004) stated that a sample consist of the subset of the population selected to participate in the research study. Sample size is the number of individuals from whom the required information is obtained. Sample size is determined by the type of the study, nature of variables, level of significance, required type of data, feasibility to conduct the study and the availability of the samples.

In this study, the sample size is arbitrarily decided to be 100. Total samples were equally distributed in Cases (50) and in Controls (Age and Sex matched controls =50).

SAMPLING TECHNIQUE

Sampling is an important step in the research process. It refers to the process of selecting the portion of the population to represent the entire population.

In this study purposive sampling technique was adopted. It is one of the non probability or non random method in which the deliberate selection of sample units that confirm to some predetermined criteria.

SAMPLING CRITERIA

In sampling criteria the researcher specifies the characteristics of the population under the study by detailing the inclusion and exclusion criteria. Inclusion criteria are characteristics that each sampling element must possess to be included in the sample. Exclusion criteria are characteristics that could confound or contaminate the results of the study therefore such participants are excluded from the study.

The following criteria was used to select the samples.

Inclusion criteria

Cases :

- Both male and female patients aged between 26-75 years
- Patients who are available on the day of data collection
- Patients with CAD (present and previous history of CAD)undergone lipid profile test
- Patients with Diabetes Mellitus and Hypertension
- Patients who are willing to participate in the study

Controls :

- Both male and female patients aged between 26-75 years
- Patients who are available on the day of data collection
- Patients without CAD undergone lipid profile test
- Patients with Diabetes Mellitus and Hypertension
- Patients who are willing to participate in the study

Exclusion criteria for Cases and Controls :

- Patients with Liver and Renal disease
- Patients with Joint pain
- Patients with Hypothyroid/Hyperthyroid disease
- Patients with Neurological and Psychiatric illness
- Patients with Anemia
- Patients with Chronic obstructive lung disease
- Patients not available on the day of data collection
- Patients who are not willing to participate in the study
- Patients below 26 years of age and above 75 years of age
- Patients who had not undergone lipid profile test

DEVELOPMENT OF THE TOOL

The instrument selected in a research should be as far as possible the vehicle that would best obtains data for drawing pertinent to the study and add to the body of knowledge in the discipline. The tool is a device that a researcher uses to collect the data. After careful and detailed review of literature, extensive library research, internet sources and consultation with experts the investigator prepared and developed a tool to collect the personal information about the patients participating in the study. The tool consists of two sections. Section-A, Section-B.

DESCRIPTION OF THE TOOL

Description of the tool refers to the explanation of the content of the tool. The researcher lists the number of items and the scoring for each item in the tool. The tool used for the present study consists of following sections.

SECTION I : Socio-demographic variables

The section sought information regarding the patients participated in the study. It consists of 13 items which includes Age, Gender, Residential Area, Religion, Marital status, Education, Occupation, Monthly Income, Type of work, Dietary pattern, Smoking history and Alcoholic history, Co-morbid disease.

SECTION-II : Lipid Profile test

A Lipid Profile is a blood test that measures the different kinds of cholesterol i.e High density lipoprotein, Low density lipoprotein, Very low density lipoprotein, and total cholesterol found in the blood as well as triglycerides. The value of very low density lipoprotein was omitted in this study because commonly total CHO, triglycerides, LDL, HDL value was used to diagnose CAD in this region. The values are given below for this study.

Lipoproteins	Decreased value	Normal value	Increased value
Total cholesterol	<150 mg/dl	150-200 mg/dl	>200 mg/dl
Triglycerides	< 40 mg/dl	40-140 mg/dl	>140 mg/dl
LDL	<65 mg/dl	65-170 mg/dl	>170 mg/dl
HDL	<35 mg/dl	35-170 mg/dl	>170 mg/dl

Scoring :

Lipoproteins	Decreased value	Normal value	Increased value
Total cholesterol	1	2	3
Triglycerides	1	2	3
LDL	1	2	3
HDL	3	2	1
Total score	**6**	**8**	**10**

So the maximum score of lipid profile was 10 and minimum score was 6. And for this study it was considered that patients falls between 1-5 was less prone to get coronary artery disease and the patient falls between 6 -10 were more prone to get coronary artery disease.

Interpretation of scores :

Lipo proteins	Cases (N=50)			Controls (N=50)		
	Decreased value	Normal value	Increased value	Decreased value	Normal value	Increased value
Total Cholesterol	6	12	32	32	10	8
Triglycerides	5	10	35	34	9	7
LDL	8	11	31	37	8	5
HDL	30	14	6	10	13	27

VALIDITY OF THE TOOL

According to **Polit and Hungler** Validity of an instrument refers to the degree to which an instrument measures what it is supposed to be measuring.

The tool prepared by the investigator sent to the experts and they were requested to check for relevance, sequence and clarity of the tool. Four nursing experts and one General physician validated the tool for its content. Suggestions were considered and the questions were modified according to the opinion of the experts.

RELIABILITY

Reliability is the degree of consistency and accuracy with which an instrument measures the attribute for which it is designed to measure.

Reliability was established by test-retest method. 5 patients with CAD undergone lipid profile test were taken as cases and 5 patients without CAD undergone lipid profile test were taken as controls. Lipid profile test report was studied from the patient's personal records and analysis was done by using appropriate statisitical analysis. Reliability was computed by Karl Pearson's correlation coefficient method. The correlation coefficient was r = 0.87. The tool was found reliable for the main study.

PILOT STUDY

The pilot study is miniature trial run of methodology planned for the majority research study, which facilitates to improve the methodology of the study, can assess the feasibility of the study and may identify the problems that may be faced by the researcher in actual larger project.

After obtaining permission from the authorities concerned of the hospital, a pilot study was conducted among 10 patients admitted in Medical ICU and Medical ward of Saravana Hospital who fulfilled the criteria for sample selection. Purposive sampling was

used to select the samples. The selected subjects were informed of the purpose of the study and consent was obtained. Demographic profiles were collected. Data was collected, tabulated and analysed using descriptive and inferential statistics and Confidentiality was ensured. The duration of the study was one week. After conducting the pilot study, it was found that the study was feasible. The concerned authority and the sample were found to be cooperative, the tool was relevant and the time and cost of the study was within the limit. The participants of the pilot study were excluded from the main study.

DATA COLLECTION PROCEDURE

Phase I : Screening phase

The study was conducted in Saravana Hospital, Madurai during the period from 04.05.2016 to 11.06.2016. The written official permission was taken from the Hospital Director through elective co-ordinator. With the help of the ward sisters and from the informations obtained from the patient's medical records, patients who fulfilled the sample selection criteria were selected to be placed in experimental and control group.

Phase II : Data collection and Implementation Phase

After identifying the samples, the purpose and procedure of data collection was explained to the patients and written consent was obtained from them. Confidentiality was ensured. Structured interview method was used to collect personal details of the patients among cases and controls. Lipid profile test reports were taken from the patients medical records with the help of the concerned ward incharge.

Phase III : Termination phase

The tool was verified for its completion. The investigator shared his vote of thanks to the patients and the ward sister and concerned hospital authorities for permission, cooperation and willingness to participate in the study. The patients were assured about the confidentiality of the data.

PLAN FOR DATA ANALYSIS

Data analysis is the systematic organization and synthesis of research data and testing of the research hypothesis using the data.

The data collected from the subjects were compiled and analyzed by using descriptive and inferential statistics. The following plan of analysis was developed.

- Distribution of samples according to background factors were explained by using frequency and percentage.
- Frequency and Percentage was used to assess the exposure rate of lipid profile and risk level of CAD.
- Odd Ratio to estimate the risk
- Chi square was used to associate the Demographic variables and CAD.

ETHICAL CONSIDERATION

For the present study, ethical values were taken into consideration. The study was accepted by the research ethical committee of the college. Prior permission was obtained from the hospital authorities and Purpose of the study was explained to the patients participated in the study and concerned ward incharge. Informed written consent was taken and the confidentiality was promised and ensured. The participants were given freedom to quit from the study if they are not willing to participate in the study. No routine duties of the employees of the hospital are withheld. No invasive procedures were involved in the study. No physical and psychological pain was caused. Thus the ethical issues were ensured in the study.

CHAPTER - IV

DATA ANALYSIS AND INTERPRETATION

Data analysis is the systematic organization and synthesis of research data and the testing of research data and also the testing of research hypothesis by using the data Interpretation is the adequate exposition of the facts presented in terms of purpose of the study. This chapter deals with the analysis and interpretation of the data collected. The data collected were edited, tabulated, analyzed and interpreted a finding obtained were presented in the form of tables and diagrams under the following sections.

THE DATA ANALYSIS WERE PRESENTED AS FOLLOWS

Section I : Data on selected background factors of the participants

Section II : Data on exposure rate of lipid profile and risk level of CAD of the participants

Section III : Data on estimated risk in lipid profile and CAD among the participants

Section IV : Data on association between demographic profile and risk level of CAD among cases

Section V : Data on other findings related to this study

SECTION I : DATA ON SELECTED DEMOGRAPHIC PROFILE OF THE PATIENTS AMONG CASES AND CONTROLS

Frequency and percentage distribution of demographic variable Age in years among cases and controls

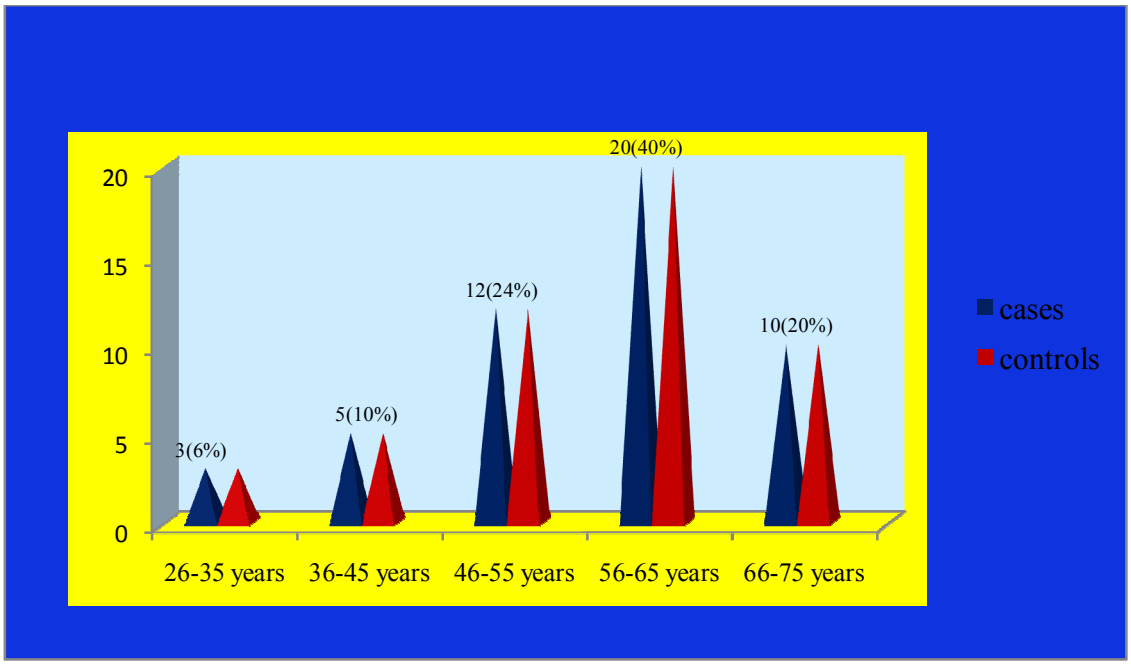

Fig 3 : Shows frequency and percentage distribution of demographic variable Age in years among cases and controls

Among the participants, majority 20(40%) were between 56-65 years and 12(24%) were between 46-55 years, 10(20%) were between 66-75 years, 5(10%) were between 36-45 years and 3(6%) were between 26-35 years in both cases and controls.

Frequency and Percentage distribution of demographic variable Gender among cases and controls

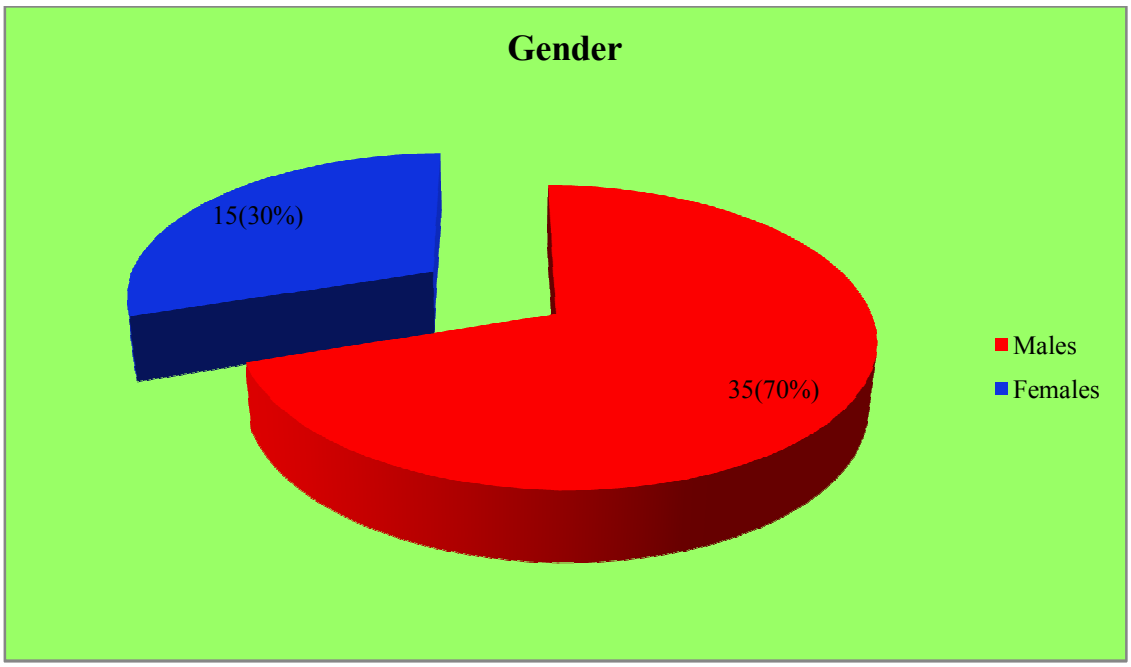

Fig 4 : Frequency and Percentage distribution of Gender among Cases and Controls

Regarding Gender, Majority 35(70%) were males and 15(30%) were females among cases and controls.

Frequency and percentage distribution of Religion among cases

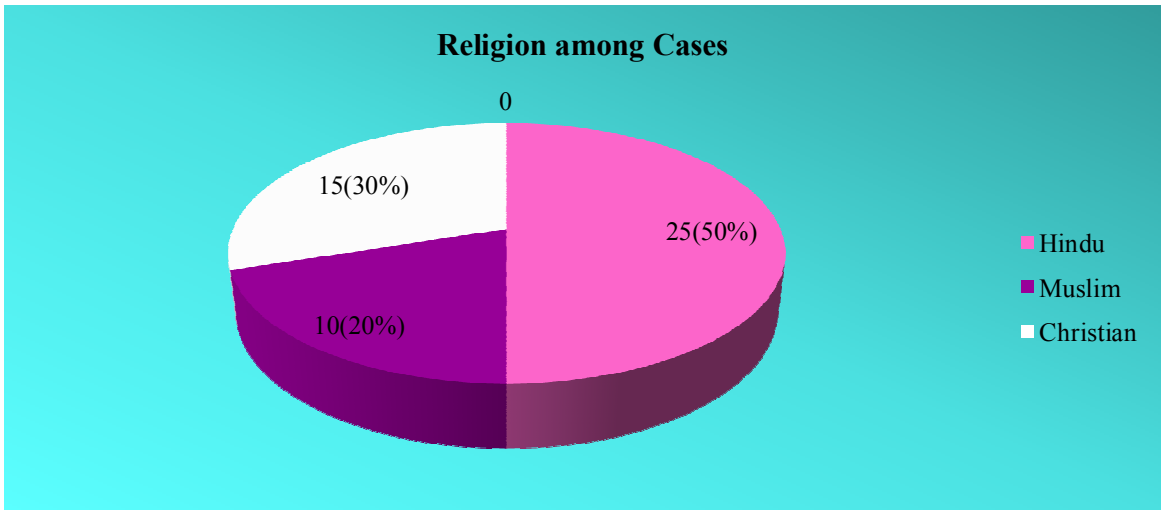

Fig 5 : Shows frequency and percentage distribution of Religion among Cases

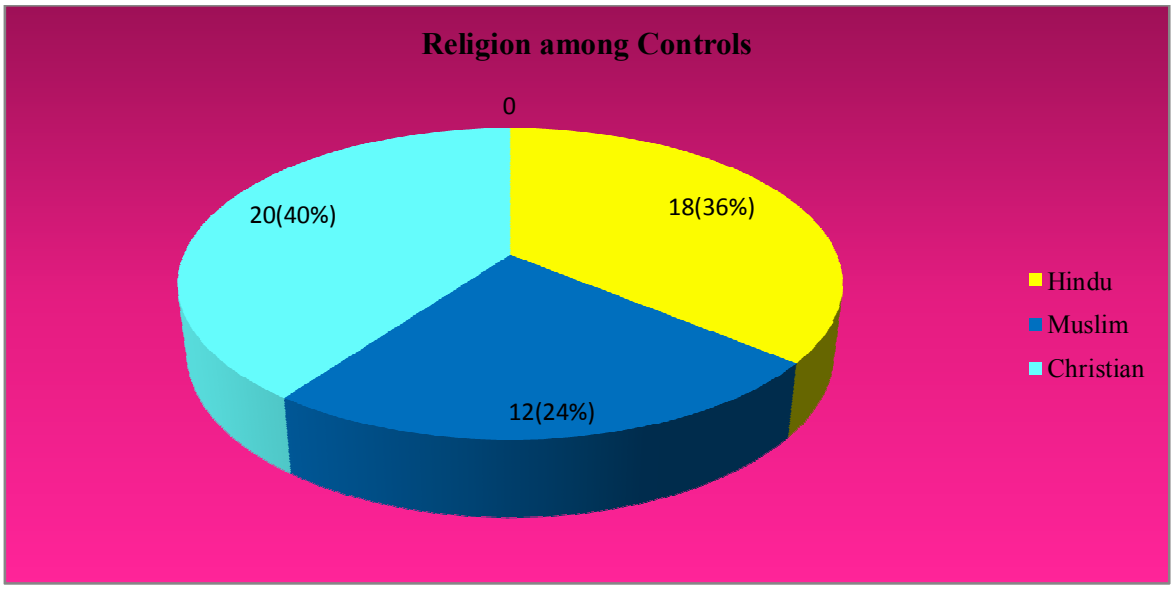

Fig 6 : Shows frequency and percentage distribution of Religion among Controls

Regarding Religion, Majority 25(50%) belong to Hindu religion, 10(20%) belong to Muslim religion and 15(30%) belong to Christian among cases whereas in controls majority 20(40%) belong to Chrisitian, 12(24%) belong to Muslim and 18(36%) were Hindus.

Frequency and percentage distribution of demographic variable Residential area among cases and controls

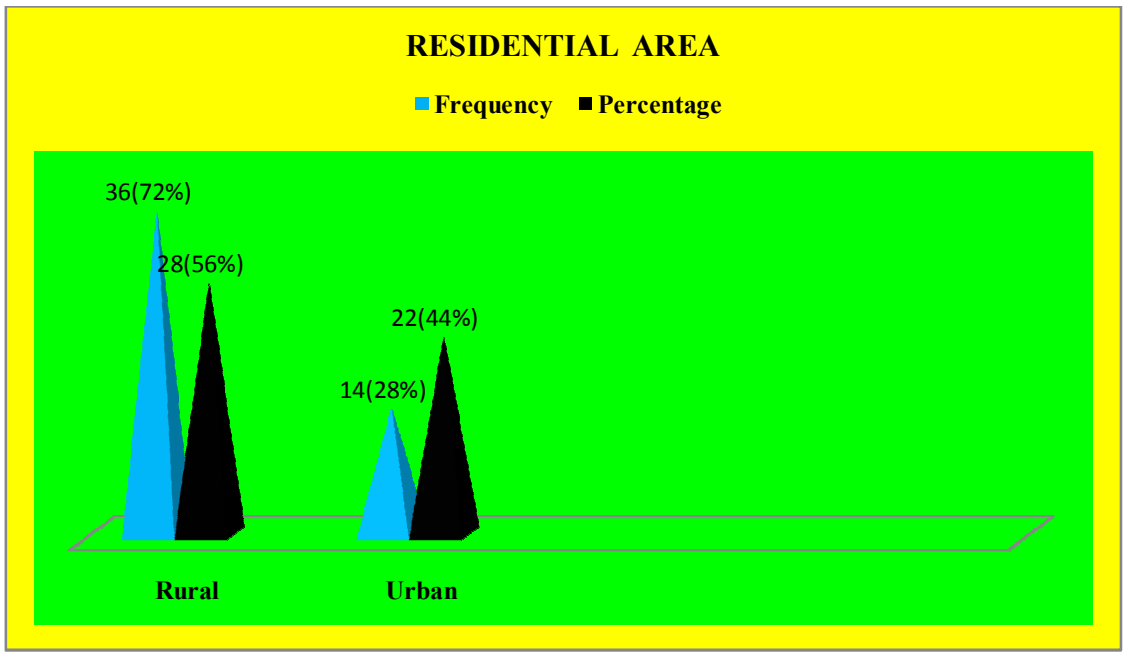

Fig 7 : Shows distribution of samples regarding residential area among cases and controls

Regarding Residential area, Among cases, Majority 36(72%) were living in rural and 14(28%) were living in urban whereas in controls 28(56%) were living in rural and 22(44%) were living in urban.

Frequency and percentage distribution of demographic variable Education among cases and controls

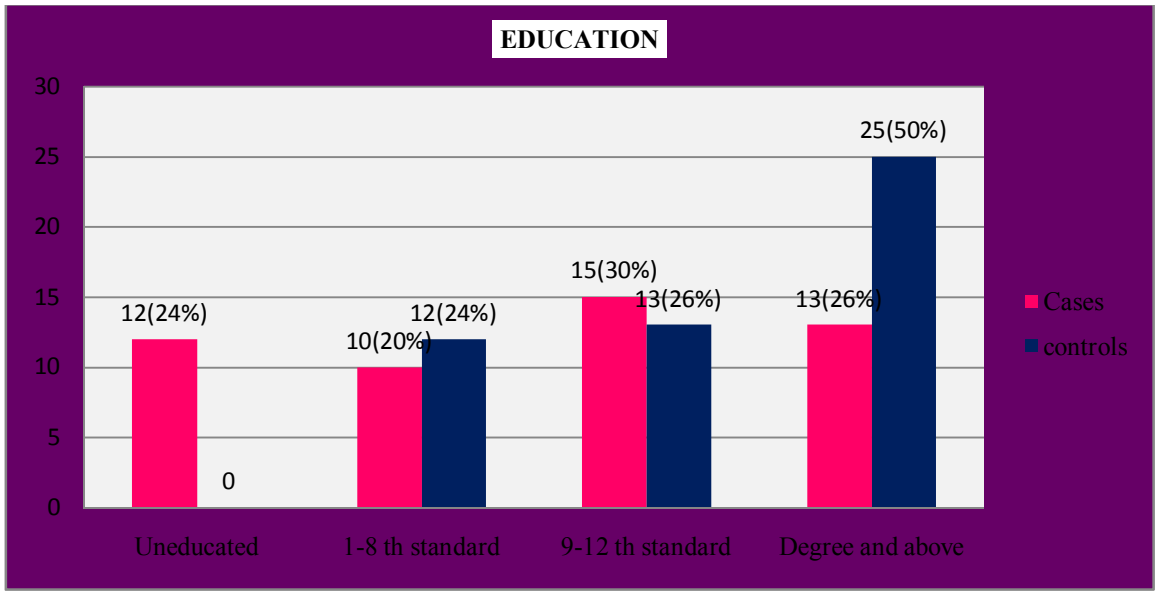

Fig 8 : Shows distribution of samples regarding Education among cases and controls

Regarding Education, Majority 15(30%) were between 9-12 th standard, 13(26%) had completed their degree and higher studies, 1/5 th of the participants studied between 1-8 th standard and 12(24%) were uneducated among cases whereas in control majority 25(50%) were in the category of degree and above, 13(26%) were studied between 9-12 th standard, 12(24%) were studied between 1-8 th standard and no one was uneducated.

Frequency and percentage distribution of demographic variable Alcoholic history among cases and controls

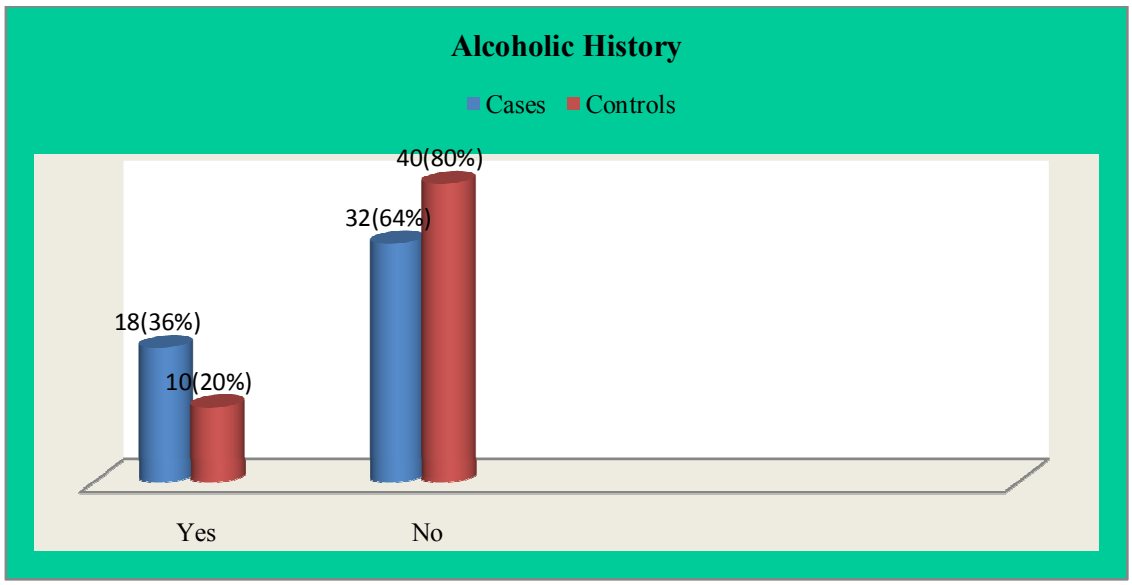

Fig 9 : Shows distribution of samples regarding Alcoholic History among cases and controls

Regarding Alcoholic history, Majority 32(64%) were alcoholics and 18(36%) didn't have the habit of drinking alcohol among cases whereas in controls 26(52%) said 'Yes' to alcoholic history and 24(48%) answered 'No" to alcoholic history.

Frequency and percentage distribution of Comorbid disease among cases and controls

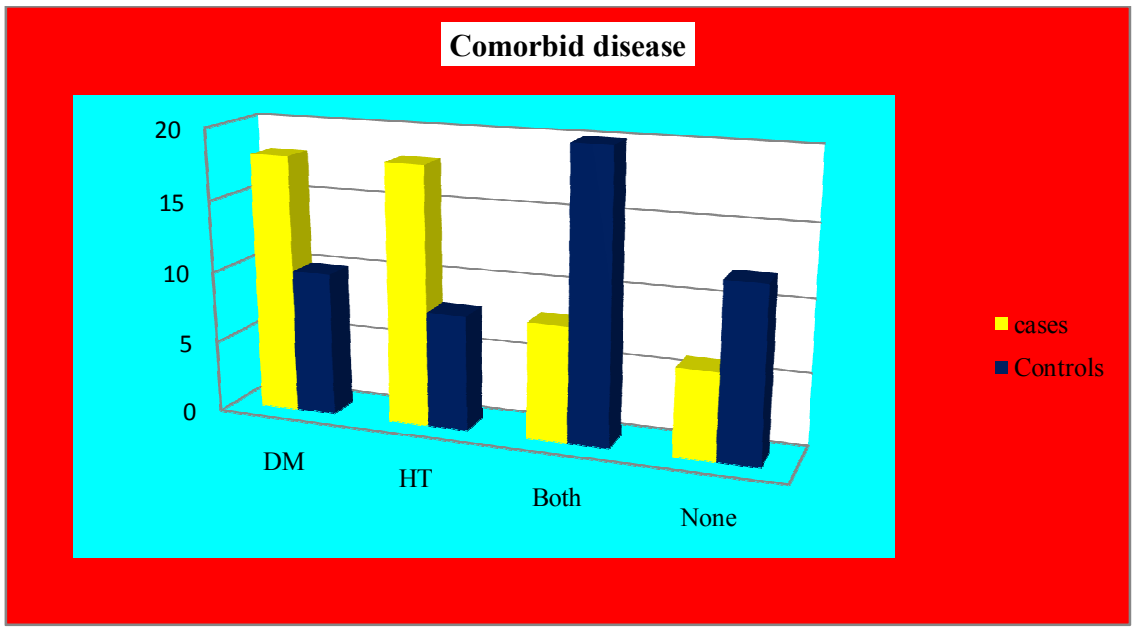

Fig 10 : Shows Frequency and Percentage distribution of Comorbid disease among Cases and Controls

Regarding Comorbid disease, Majority 18(36%) were equally distributed in the category of DM and HT, 8(16%) had both DM and HT and 6(12%) didn't have the history of any comorbid disease among cases whereas in controls 20(24%) were suffering from DM and HT, 1/10 th of the participants had DM, 8(16%) had Hypertension, and 12(24%) had no evidence of Comorbid disease.

TABLE I : FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEMOGRAPHIC VARIABLES OF THE PARTICIPANTS AMONG CASES AND CONTROLS

S.No	Demographic Variable	Experimental group (N=30)		Control group (N=30)	
		Fre	Per	Fre	Per
1.	**Occupation**				
	a) Unemployed	22	44%	18	36%
	b) Labour	12	24%	14	28%
	c) Non Professional	14	28%	14	28%
	d) Professional	2	4%	4	8%
2.	**Monthly Income**				
	a) Less than Rs.5001	5	10%	13	26%
	b) Rs.5001-10000	15	30%	17	34%
	c) Rs.10001-15000	20	40%	18	36%
	d) Above Rs.15000	10	20%	2	4%
3.	**Marital status**				
	a) Unmarried	1	2%	0	0%
	b) Married	42	84%	35	70%
	c) Separated/Divorced	4	8%	7	14%
	d) Widow/Widower	3	6%	8	16%
4.	**Dietary pattern**				
	a) Vegetarian	5	10%	12	24%
	b) Non vegetarian	45	90%	38	76%

5.	**Type of work**				
	a) Sedentary	20	40%	24	48%
	b) Moderate	20	40%	18	36%
	c) Strenous	10	20%	8	16%
6.	**Smoking history**				
	a) Yes	22	44%	18	36%
	b) No	28	56%	32	64%

Table No 1: Shows the frequency and percentage distribution of demographic variables of participants among cases and controls

Regarding **Occupation**, Majority 22(44%) were unemployed, 12(24%) were labour, 14(28%) were doing non professional work and 2(4%) had fallen in the category of professional work among cases whereas in controls majority 18(36%) were unemployed and 14(28%) were equally distributed in the category of non professional and labour and 4(8%) belong to professional work.

Regarding Monthly Income, Majority 20(40%) were earning between Rs.10001-15000, 15(30%) were in the category of Rs.5001-10000, 1/5 th of the participants 10(20%) were earning more than Rs.15000 and 1/10 th of the participants 5(10%) salary was below Rs. 5001 among cases whereas in controls majority of the participants 18(36%) were earning Rs.10001-15000 and 17(34%) were earning between Rs.5001-10000, 13(26%) were getting salary less than Rs.5001 and 2(4%) were earning above Rs.15000.

Regarding Marital status, Majority 42(84%) of the participants were married, 4(8%) were fallen under the category of separated and divorced and 3(6%) were widow/widower,1(2%) was unmarried among cases whereas in controls majority

35(70%) were married, 8(14%) were widow/widower, 7(14%) were separated/divorced and no one was unmarried.

Regarding Dietary Pattern, Majority 45(90%) were non vegetarians, 1/10 th of the participants(10%) were vegetarians among cases whereas in controls 38(76%) were non vegetarians and 12(24%) were vegetarians.

Regarding **Type of work,** Majority 20(40%) were equally distributed in sedentary and moderate work and 1/10 th of the participants 10(20%) were in strenuous activities among cases whereas in controls majority 24(48%) were doing sedentary work, 18(36%) were in moderate work and 8(16%) were doing strenuous activities.

Regarding Smoking history, Majority 22(44%) were smokers and 28(56%) were non smokers among cases whereas in controls majority 32(64%) had the habit of smoking and 18(36%) didn't have the habit of smoking.

In Cases, Majority of the participants 20(40%) were between 56-65 years and 35(70%) were males, 25(50%) belong to Hindu religion, 36(72%) were living in rural, 15(30%) were studied between 9-12 th standard, 22(44%) were unemployed, 20(40%) were earning between Rs.10001-15000, 42(84%) were married, 45(90%) were non vegetarian, 20(40%) were equally distributed in sedentary and moderate work 28(56%) didn't have the habit of smoking and 32(64%) had alcoholic history,18(36%) were equally distributed in the category of DM and HT whereas in controls 20(40%) were fallen in the age group between 56-65 years, 35(70%) were males and 20(40%) were Chrisitians, 28(56%) were residing in rural area, 25(50%) had completed degree and higher studies, 18(36%) were unemployed, 18(36%) were earning between Rs.10001-15000, 35(70%) were married, 38(76%) were non vegetarians, 24(48%) had sedentary work, 32(64%) were non smokers and 26(52%) were alcoholics and 20(40%) had diagnosed as having both DM and HT.

SECTION II : DATA ON EXPOSURE RATE OF LIPID PROFILE AND RISK LEVEL OF CAD AMONG CASES AND CONTROLS

TABLE – II

Frequency and percentage distribution of samples among cases and controls regarding lipid profile

Lipoproteins	Cases (N=50)						Controls (N=50)					
	Decreased Value		Normal Value		Increased Value		Decreased Value		Normal Value		Increased Value	
	fre	%	fre	%	fre	%	fre	%	fre	%	Fre	%
Total cholesterol	6	12	12	24	32	64	32	64	10	20	8	16
Triglycerides	5	10	10	20	35	70	34	68	9	18	7	14
LDL	8	16	11	22	31	62	37	74	8	16	5	10
HDL	30	60	14	28	6	12	10	20	13	26	27	54

Table 2 : Shows distribution of samples according to lipid profile test report

In Cases the participants got the decreased value of lipoproteins HDL, LDL, Total Cholesterol, Triglycerides were 30(60%),8(16%),6(12%),5(10%) whereas 14(28%)got optimal value of HDL, 12(24%) had normal value of total cholesterol, 11(22%) had optimal LDL and $1/10^{th}$ (20%) of the participants triglycerides was normal and 35(70%) had highest Triglycerides, 32(64%) had high total cholesterol, 31(62%) had increased LDL and only 6(12%) had increased HDL.

In Controls, only 8(16%) had increased Total Cholesterol, 10(20%) had optimal level of total cholesterol, 32(64%) had decreased value of total cholesterol, 34(68%) had

decreased value of Triglycerides, 9(18%) had optimal value of triglycerides and 7(14%) got increased value of triglycerides, 37(74%) participants LDL were decreased, 8(16%) had optimal LDL, 5(10%) had increased LDL, majority 27(54%) had increased HDL value, 13(26%) had normal level of HDL and one tenth of the participants(20%) had decreased HDL.

TABLE – III

Frequency and percentage distribution among cases and controls regarding exposure rate of coronary artery disease

Scores on lipid profile	Cases (with CAD)		Controls (without CAD)		Total
	fre	%	fre	%	
1-5	13	26%	39	78%	58
6-10	37	74%	11	22%	42
Total	50	100%	50	100%	100

Table 3 : Shows distribution of samples among cases and controls based on scores of lipid profile test

Among Cases majority 37(74%) had got scores between 6-10 which meant for they were more prone to get CAD and only 13(26%) had scored between 1-5 which has taken as less risk to get CAD for this study whereas in Counterparts, 39(78%) had minimal scores in lipid profile test i.e.between 1-5 and nearly 1/10 th of the participants (22%) had abnormal lipid profile i.e between 6-10.

In cases ¾ the of the participants had abnormal lipid profile. This is three and half times higher than the controls. In controls only 11(22%) had abnormal lipid profile which shows that risk level of CAD was definitely higher among cases than controls

because in controls majority 39(78%) fallen under the category of less prone to get disease. Hence Hypothesis 1 was accepted, therefore it is interpreted that there was a significant exposure rate of lipid profile and risk level of CAD among the participants.

SECTION III : DATA ON ESTIMATION OF RISK IN LIPID PROFILE

TABLE – IV

Odd ratio or relative risk of coronary artery disease

Scores on lipid profile	Cases (with CAD)	Controls (without CAD)	Total
1-5	13(a)	39(b)	52
6-10	37(c)	11(d)	48
Total	50	50	100

Table 4 : Shows odd ratio or relative risk of CAD

Odd Ratio = (a/b) / (c/d) = ad/bc = (37x39) / (11x13) =1443/143=10.09

In the above table, patients who had scored between 6-10 showed a risk of having CAD 10.09 times more that of the patients scored between 1-5. Therefore Hypothesis 2 was accepted and it can be interpreted that there is a significant estimated risk in lipid profile and CAD among the participants.

SECTION – V : DATA ON ASSOCIATION BETWEEN DEMOGRAPHIC PROFILE AND CORONARY ARTERY DISEASE

TABLE – V

S.No	Demographic Variable	Cases (N=50)		χ^2
		Fre	Per	
1.	**Age of the patient**			
	a) 26-35 years	3	6%	χ^2 = 41.35
	b) 36-45 years	5	10%	Df = 4
	c) 46-55 years	12	24%	P<0.05
	d) 56-65 years	20	40%	**S**
	e) 66-75 years	10	20%	
2.	**Gender**			χ^2 = 190.32
	a) Male	35	70%	Df = 1
	b) Female	15	30%	P<0.05
				S
3.	**Religion**			χ^2 = 108.66
	a) Hindu	25	50%	Df = 2
	b) Muslim	10	20%	P<0.05
	c) Christian	15	30%	**S**
4.	**Residential area**			χ^2 = 158.3
	a) Rural	36	72%	Df = 1
	b) Urban	14	28%	P<0.05
				S
5.	**Education**			
	a) Uneducated	12	24%	χ^2 = 49.04
	b) 1-8 th standard	10	20%	Df = 1
	c) 9-12 th standard	15	30%	P<0.05
	d) Degree and above	13	26%	**S**

6.	**Occupation**			
	a) Unemployed	22	44%	χ^2 = 240.4
	b) Labour	12	24%	Df = 3
	c) Non Professional	14	28%	P<0.05
	d) Professional	2	4%	**S**
7.	**Monthly Income**			
	a) Less than Rs.5001	5	10%	χ^2 = 38.07
	b) Rs.5001-10000	15	30%	Df = 3
	c) Rs.10001-15000	20	40%	P<0.05
	d) Above Rs.15000	10	20%	**S**
8.	**Marital status**			
	a) Unmarried	1	2%	χ^2 = 1371
	b) Married	42	84%	Df = 3
	c) Separated/Divorced	4	8%	P<0.05
	d) Widow/Widower	3	6%	**S**
9.	**Dietary pattern**			χ^2 = 27.6
	a) Vegetarian	5	10%	Df = 1
	b) Non vegetarian	45	90%	P<0.05
				S
10.	**Type of work**			χ^2 = 40.48
	a) Sedentary	20	40%	Df = 2
	b) Moderate	20	40%	P<0.05 **S**
	c) Strenous	10	20%	
11.	**Smoking history**			χ^2 = 17.29
	a)Yes	22	44%	Df = 1
	b)No	28	56%	P<0.05
				S
12.	**Alcoholic history**			χ^2 = 5.37
	a)Yes	18	36%	Df = 1
	b) No	32	64%	P<0.05
				S

13.	**Comorbid disease**			χ^2 = 110
	a)Diabetes Mellitus	18	36%	Df = 3
	b)Hypertension	18	36%	P<0.05
	c)Both	8	16%	**S**
	d)None	6	12%	

Table 5 : Shows the chi square value regarding demographic profile and risk level of CAD.

Among Cases the obtained chi square value regarding Age in years 41.3(P<0.05), Gender 190.32(P<0.05), Religion 108.66(P<0.05), Residential area 158.3(P<0.05), Education 49.04(P<0.05), Occupation 240.4(P<0.05), Monthly Income 38.07(P<0.05), Marital status 1371(P<0.05), Dietary pattern 27.6(P<0.05), Type of work 40.48(P<0.05), Smoking history 17.29(P<0.05), Alcoholic history 5.37(P<0.05), Comorbid disease 110(P<0.05) was significant.

It was inferred that there was significant association between demographic variables and risk level of CAD among cases. Hence hypothesis 3 was accepted.

SECTION V : OTHER FINDINGS RELATED TO LIPID PROFILE AND CAD

DATA ON TYPE OF CORONARY ARTERY DISEASE AMONG CASES

TABLE – VI

Frequency and percentage distribution of samples among cases regarding type of coronary artery disease

Coronary Artery Disease	Cases (N=50)	
	Fre	%
MI	14	28%
Angina Pectoris	16	32%
Congestive Heart Failure	15	30%
Ischemic heart disease	5	10%
No of patients	50	100%

Table 6: Shows the distribution of samples regarding type of CAD

Among 50 patients with CAD, 14(28%) had MI, 16(32%) had diagnosed as having Angina Pectoris, 15(30%) were suffering from CHF, 5(10%) had IHD.

TABLE – VII

Frequency and percentage distribution of scores in lipid profile test among various types of coronary artery disease

Scores on lipid profile test	CASES							
	MI		Angina		CHF		IHD	
	Fre	%	Fre	%	Fre	%	Fre	%
1-5	4	8%	4	8%	3	6%	2	4%
6-10	10	20%	12	24%	12	24%	3	6%

Table 7 : Shows distribution of samples based on lipid profile test and type of CAD among cases

Among 14 MI patients, 10(20%) had fallen between 6-10 and only 4 (8%) belong to 1-5 and among 16 Angina Pectoris patients 12(24%) had scored between 6-10 and 4(8%) had got scores between 1-5 and in 15 CHF and 5 IHD the patients scored between 6-10 were 12(24%), 3(6%), the participants scored between 1-5 were 3(6%), 2(4%).

TABLE - VIII

Findings related to Mean, SD, ‘t” value among cases and controls

S.No	Participants	Mean	SD	Range	Mean difference	‘t’ value
1.	**Cases**	7	1.61	6 (4-10)	2	7.46 Df = 99 P<0.05 S
2.	**Controls**	5	1.04	4 (4-8)		

S- Significant

Table 8 : Shows Mean, SD, Range, Mean difference and Paired ‘t” test value of cases and controls

The obtained overall mean got from the scores of lipid profile test was 7(SD=1.61) in cases was more than the obtained overall mean 5(1.04) in controls. The obtained mean difference was 2 and the ‘t’ value was 7.46(P<0.05). This explains that there is a significant risk of getting CAD when the participants has dyslipidemia.

CHAPTER – V

SUMMARY, FINDINGS, DISCUSSION, IMPLICATIONS, LIMITATIONS, RECOMMENDATIONS AND CONCLUSION

This chapter deals with summary, findings, discussion, implications, limitations, recommendations and conclusion. The essence of any research project is based on study findings, limitations, interpretation, of the research results and recommendations to incorporate the study implications. It also gives meaning to the results obtained in the study.

SUMMARY

The main aim of the study was to assess the relationship between lipid profile and risk level of CAD among the patients admitted in selected hospital.

OBJECTIVES OF THE STUDY

- To assess the exposure rate of lipid profile and risk level of CAD among patients admitted in selected hospital
- To assess estimation of risk in lipid profile and risk level of CAD among patients admitted in selected hospital
- To find out the association between the Demographic variables and risk level of CAD among patients admitted in selected hospital

The study attempted to examine the following research hypothesis

H_1: There is a significance exposure rate of lipid profile and risk level of CAD among patients admitted in selected hospital.

H_2: There is significance estimated risk in lipid profile and CAD among patients admitted in selected hospital.

H_3: There is a significant association between the demographic variables and risk level of CAD among patients admitted in selected hospital.

Extensive literature was done for the present study and the reviews were presented in the following headings,

- **Studies related to prevalence of CAD and its risk factors**
- **Studies related to prevalence of dyslipidemia in CAD**
- **Studies related to lipid profile and severity of CAD**
- **Studies related to association between demographic variables and CAD**

The conceptual framework adopted for the present study was based on General system theory. This theory helped the investigator to assess the significant relationship between lipid profile and CAD.

The research design selected for the present study was retrospective case control study to investigate effect to cause relationship between lipid profile and CAD. The independent variable was lipid profile and the dependant variable was CAD.

The investigator developed a structured questionnaire to get the personal details of the participants and took lipid profile test as a tool for the present study. The content validity of the tool was established by 5 experts. The reliability of the tool was ascertained by test retest method and r=0.87 and the tool were found to be reliable. Pilot study was conducted in Saravana Hospital, Madurai among 10 participants fulfilled the sample selection criteria. The study was found to be feasible.

The main study also was conducted in Saravana Hospital, Madurai. The samples participated in pilot study were excluded from the study. Prior permission from the authorities was sought and obtained. Non probability purposive sampling technique was used to select the samples and informed consent was obtained. Patient's personal details were collected by structured interview schedules and lipid profile test reports were collected from patient's personal records. The data gathered were analyzed and interpreted manually. A probability of $P<0.05$ level of significance was considered significant.

FINDINGS

The main findings of the study were classified under following headings.

I. Findings : Related to selected demographic variables of the participants in cases and controls.

In Cases, Majority of the participants 20(40%) were between 56-65 years and 35(70%) were males, 25(50%) belong to Hindu religion, 36(72%) were living in rural, 15(30%) were studied between 9-12 th standard, 22(44%) were unemployed, 20(40%) were earning between Rs.10001-15000, 42(84%) were married, 45(90%) were non vegetarian, 20(40%) were equally distributed in sedentary and moderate work 28(56%) didn't have the habit of smoking and 32(64%) had alcoholic history,18(36%) were equally distributed in the category of DM and HT whereas in controls 20(40%) were fallen in the age group between 56-65 years, 35(70%) were males and 20(40%) were Chrisitians, 28(56%) were residing in rural area, 25(50%) had completed degree and higher studies, 18(36%) were unemployed, 18(36%) were earning between Rs.10001-15000, 35(70%) were married, 38(76%) were non vegetarians, 24(48%) had sedentary work, 32(64%) were non smokers and 26(52%) were alcoholics and 20(40%) had diagnosed as having both DM and HT.

II. Findings : Related to exposure rate of lipid profile and risk level of CAD among cases and controls

In Cases the participants got the decreased value of lipoproteins HDL,LDL,Total Cholesterol, Triglycerides were 30(60%),8(16%),6(12%),5(10%) whereas 14(28%)got optimal value of HDL, 12(24%) had normal value of total cholesterol, 11(22%) had optimal LDL and $1/10^{th}$ (20%) of the participants triglycerides was normal and 35(70%) had highest Triglycerides, 32(64%) had high total cholesterol, 31(62%) had increased LDL and only 6(12%) had increased HDL.

In Controls, only 8(16%) had increased Total Cholesterol, 10(20%) had optimal level of total cholesterol, 32(64%) had decreased value of total cholesterol, 34(68%) had decreased value of Triglycerides, 9(18%) had optimal value of triglycerides and 7(14%) got increased value of triglycerides, 37(74%) participants LDL were decreased, 8(16%) had optimal LDL, 5(10%) had increased LDL, majority 27(54%) had increased HDL value, 13(26%) had normal level of HDL and one tenth of the participants(20%) had decreased HDL.

Among Cases majority 37(74%) had got scores between 6-10 which meant for they were more prone to get CAD and only 13(26%) had scored between 1-5 which has taken as less risk to get CAD for this study when compared to their counterparts. Whereas in Counterparts, 39(78%) had minimal scores in lipid profile test i.e.between 1-5 and nearly 1/10 th of the participants (22%) had abnormal lipid profile i.e between 6-10.

In cases ¾ the of the participants had abnormal lipid profile. This is three and half times higher than the controls. In controls only 11(22%) had abnormal lipid profile which shows that frequency rate of CAD was definitely higher among the participants got scores between 6-10 than the patients got scores between 1-5. Hence Hypothesis 1 was accepted, therefore it was interpreted that there was a significant exposure rate of lipid profile and CAD among the participants.

III. Findings : Related to estimation of risk in lipid profile

In the above example, patients who had scored between 6-10 showed a risk of having CAD 10.09 times more that of the patients scored between 1-5. Therefore Hypothesis 2 was accepted and it can be interpreted that there is a significant estimated risk in lipid profile and CAD among the participants.

IV. Findings : Related to association between demographic variables and coronary artery disease

Among Cases the obtained chi square value regarding Age in years 41.3($P<0.05$), Gender 190.32($P<0.05$), Religion 108.66($P<0.05$), Residential area 158.3($P<0.05$), Education 49.04($P<0.05$), Occupation 240.4($P<0.05$), Monthly Income 38.07($P<0.05$), Marital status 1371($P<0.05$), Dietary pattern 27.6($P<0.05$), Type of work 40.48($P<0.05$), Smoking history 17.29($P<0.05$), Alcoholic history 5.37($P<0.05$), Comorbid disease 110($P<0.05$) was significant.

It was inferred that there was significant association between demographic variables and risk level of CAD among cases. Hence hypothesis 3 was accepted.

DISCUSSION

The results of the study were discussed according to the objectives of the study

Objective 1 : to assess the exposure rate of lipid profile and risk level of CAD among patients admitted in selected hospital

Among Cases majority 37(74%) had got scores between 6-10 which meant for they were more prone to get CAD and only 13(26%) had scored between 1-5 which has taken as less risk to get CAD for this study when compared to their counterparts. Whereas in Counterparts, 39(78%) had minimal scores in lipid profile test i.e. between 1-5 and nearly 1/10 th of the participants (22%) had abnormal lipid profile i.e between 6-10.

In cases ¾ the of the participants had abnormal lipid profile. This is three and half times higher than the controls. In controls only 11(22%) had abnormal lipid profile

which shows that frequency rate of CAD was definitely higher among the participants got scores between 6-10 than the patients got scores between 1-5.

The above findings were supported by **Mainul Haque et.,al (2016).** The study found that high serum cholesterol is an important single risk factor for CAD and increase in the level of LDL-Cholesterol and a decrease in HDL-Cholesterol also high among the samples diagnosed as CAD.

Objective 2 : to estimate the risk in lipid profile

Patients who had scored between 6-10 showed a risk of having CAD 10.09 times more that of the patients scored between 1-5.

The above findings were supported by **Yan Zhuang et.al (2016).** He found that participants had abnormal lipid profile showed a risk of having CAD 6 times more that of the patients scored between 1-5.

Objective 3 : to find out the association between demographic profile and CAD.

There was significant association between all demographic variables and risk level of CAD.

William M.Schultz (2017) supported this by finding that marital status independently associated with CAD, **Peter Smith (2016)** said that there was a association between type of work and risk level of CAD, **Yang Yang (2016**) found that high alcohol consumption is associated with increased risk of CAD, **Kurd BJ (2014)** found that age and sex was associated with CAD, **Krithiga Shridhar (2014**) found that dietary pattern was associated with risk level of CAD, **Mark Woodward(2012)** concluded that there was association between education and CAD.

IMPLICATIONS

The main aim of the study was to assess lipid profile test and risk level of CAD among the patients admitted in Saravana Hospital, Narimedu, Madurai. The following conclusion was drawn on the basis of findings of the study.

- There was a significant exposure rate of lipid profile and CAD among the participants.
- The patients got high scores in lipid profile showed a risk of having CAD 10 times that of their counterparts.
- There was a significant association between demographic profiles and risk level of CAD.

Nursing Implications :

The findings of the study have implications on the field of nursing education, nursing practice, nursing administration and nursing research.

Nursing Education :

- The nurse educator have the responsibility to update the knowledge, attitude and practice of nursing students on knowledge and awareness about dyslipidemia and CAD.

- The findings of the study can serve as guidelines for the nurse educators for planning and conducting educational programmes for student nurses regarding dyslipidemia and CAD.

- The nursing students should be made aware about their role in health promotion of the patients suffering from CAD.

- The students should be motivated to make up innovational approaches to provide health education regarding lifestyle practices to avoid CAD.

- In service education can be planned for the nurse to keep them updated with latest guidelines to prevent dyslipidemia and CAD.

- Health Education programme can be conducted for the patients regarding lifestyle modification thusby preventing dyslipidemia and CAD.

- Encourage the student nurse to participate actively in awareness of community in awareness campaign and it should be conducted on regular basis with emphasis on dyslipidemia and CAD.

Nursing Research :

- The study provides baseline data for conducting other research studies.

- The study will be a motivation for the budding researchers to conduct similar studies in larger samples.

- The study will be a reference for the research scholars.

Nursing Administration :

- Nurse administrator has to plan and organize training programme for the student nurses and the nurses regarding dyslipidemia.
- Nurse administrator has to organize educational programs in the schools, colleges, community health centres, primary health centres and the other community settings.

- Necessary administrative support has to be provided to conduct health educational workshop in schools, colleges and other community area with appropriated with AV aids, mass media, posters and role plays, drama and puppet show.
- Nurses should be motivated to take keen interest in preparing different teaching strategies suitable for the schools, colleges as well as other community settings on dyslipidemia and CAD.

LIMITATIONS

- The study was limited to only one hospital.
- The study was limited to the experience of the researcher.
- The study was confined to a small number of subjects which limits the generalization that can be made.
- Random sampling could not be used.

RECOMMENDATIONS

On the basis of the findings of the study, the following recommendations have been made:

- A similar study can be replicated on a large sample to generalize the findings.
- A similar study can be conducted in the clients coming to various institutional settings such as government and private institutions.
- A similar study conducted to find difference in the prevalence of CAD among urban and rural population
- A similar study can be conducted among staff nurses to find differences in the knowledge level regarding CAD and its risk factors.
- A study can be conducted to compare the various risk factors causing CAD

PERSONAL EXPERIENCE

- The investigator gained lot of new information and experience throughout the study.
- The investigator didn't face much problems in selecting the sample. All the samples participated in the study, understood the purpose of the study and were very co-operative.
- Apart from that the investigator has found that doing this research was quite interesting and helpful.

CONCLUSION :

The importance of the study lies in the fact that it reveals a distinct association of dyslipidemia with CAD and highlights patients with dyslipidemia as potential targets for early intervention. Therefore, early detection of abonormal lipid profile and its proper management by lifestyle modification and by drugs, if needed may play a key role in preventing the progress of the atherosclerotic process in coronary artery disease.

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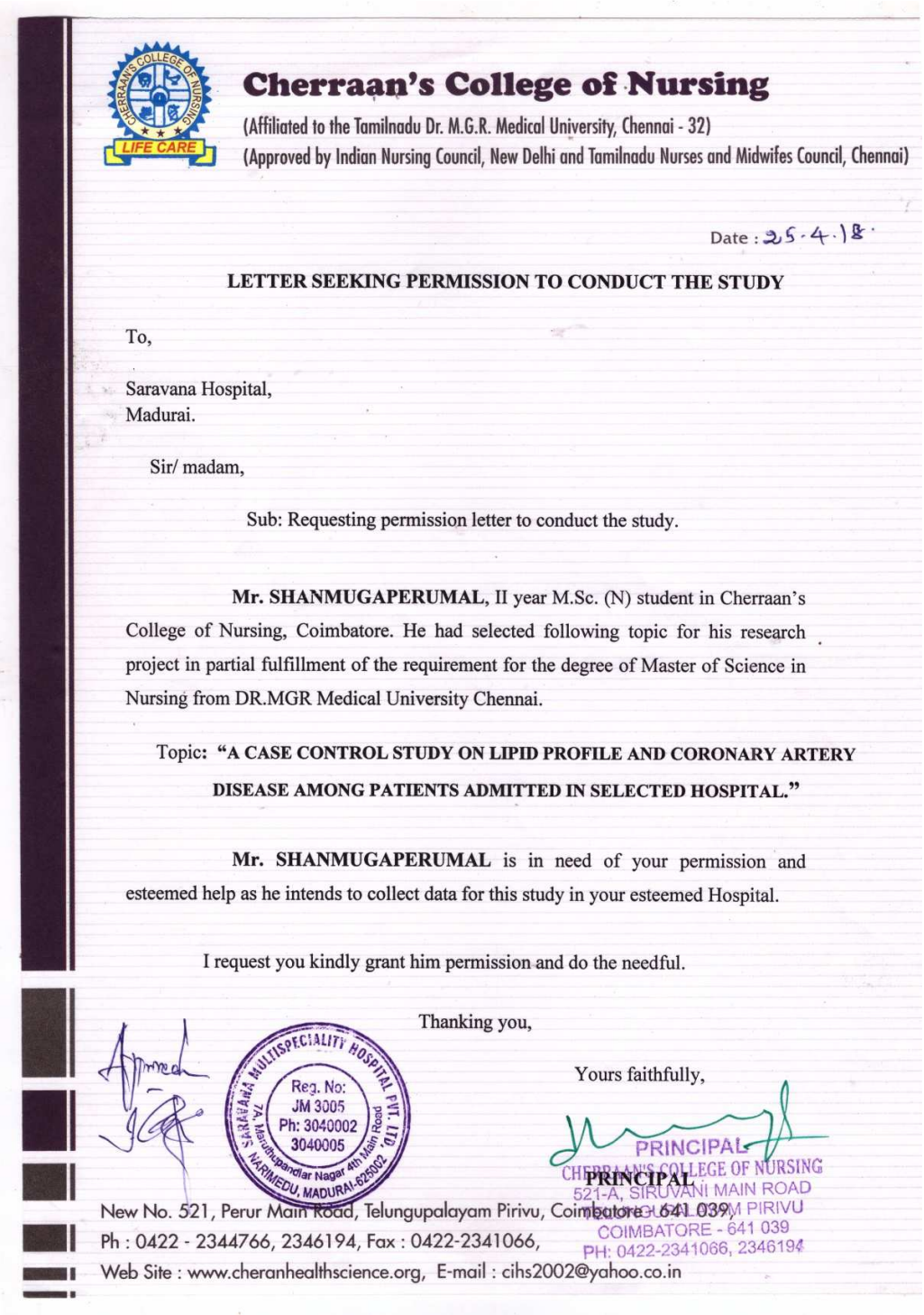
APPENDIX – I

LETTER SEEKING AND GRANTING PERMISSION TO CONDUCT MAIN STUDY



Cherraan's College of Nursing

(Affiliated to the Tamilnadu Dr. M.G.R. Medical University, Chennai - 32)
(Approved by Indian Nursing Council, New Delhi and Tamilnadu Nurses and Midwifes Council, Chennai)

Date : 25.4.18

LETTER SEEKING PERMISSION TO CONDUCT THE STUDY

To,

Saravana Hospital,
Madurai.

Sir/ madam,

Sub: Requesting permission letter to conduct the study.

Mr. SHANMUGAPERUMAL, II year M.Sc. (N) student in Cherraan's College of Nursing, Coimbatore. He had selected following topic for his research project in partial fulfillment of the requirement for the degree of Master of Science in Nursing from DR.MGR Medical University Chennai.

Topic: **"A CASE CONTROL STUDY ON LIPID PROFILE AND CORONARY ARTERY DISEASE AMONG PATIENTS ADMITTED IN SELECTED HOSPITAL."**

Mr. SHANMUGAPERUMAL is in need of your permission and esteemed help as he intends to collect data for this study in your esteemed Hospital.

I request you kindly grant him permission and do the needful.

Thanking you,

Yours faithfully,

SARAVANA MULTISPECIALITY HOSPITAL PVT. LTD. Reg. No: JM 3005 Ph: 3040002 3040005 74 Meenakshipandiar Nagar 4th Main Road NARIMEDU, MADURAI-625002

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APPENDIX – II

LETTER SEEKING EXPERT OPINION AND SUGGESTIONS FOR THE CONTENT VALIDITY OF THE TOOL

From,

Mr.R.Shanmugaperumal
Reg. No : 301610251,
II nd year M.Sc Nursing,
Cherran's College of Nursing,
Coimbatore.

To,

Respected Sir / Madam,

Sub : Seeking permission for content validity of the research tool

With due respect I Mr.R.Shanmugaperumal, Reg. No : 301610251, II nd Year M.Sc Nursing student of Cherran's College of Nursing, Coimbatore humbly request you Madam/Sir to go through the tool which is to be used for the data collection for " Case control study on Lipid Profile and Coronary artery disease among patients admitted in selected hospital, Madurai."

I herewith attach my tool along with necessary document.

Here with I am enclosing a copy of

- Content
- Questionnaire
- Criteria rating scale for validation

- Content validity certificate

With regard to this I request you to kindly give your valuable suggestions regarding accuracy, appropriateness and relevancy. Also I request you to kindly sign the certificate stating that you have validated the tool. Your kind co-operation and expert judgement will be very much appreciated.

Thanking You,

Yours faithfully

(Mr.Shanmugaperumal)

APPENDIX – III

CERTIFICATE OF VALIDATION

This is to certify that the tool developed by Mr.R.Shanmugaperumal, Reg No : 301610251, II year M.Sc Nursing student of Cherran's College of Nursing undertaking a research on " Case control study on Lipid profile and coronary artery disease among patients admitted in selected hospital" is validated by undersigned and can proceed with this tool and conduct the main study for dissertation.

Signature of Expert

APPENDIX – IV

LIST OF EXPERTS

1. **Mrs. Ramalakshmi, M.Sc(N),**
   Vice Principal,
   Cherran's College of Nursing,
   Coimbatore.

2. **Dr. K. Priscilla Ph.D.,**
   Medical and Surgical Nursing
   CSI Jeyaraj Annapackiyam College of Nursing
   Madurai.

3. **Mr.G.Loganathan, M.Sc (N),**
   Principal
   National College of Nursing
   Bangalore.

4. **G. Jeya Thangaselvi**
   Head of Department, Medical and Surgical Nursing
   CSI Jeyaraj Annapackiyam College of Nursing
   Madurai.

5. **Dr.Rathinavel M.Ch**
   Consultant Cardiologist,
   Saravana Hospital,
   Narimedu,

Madurai.

APPENDIX - V

CONSENT FORM FOR STUDY PARTICIPANTS

I ------- give my consent to participate in the research titled, ”’A case control study on lipid profile and risk level of coronary artery disease among the patients attempted suicide in selected hospital, Madurai” which is being conducted by 301610251, II nd year M.Sc (N), Cherran’s College of Nursing, Coimbatore as part of curriculum I understand that this participation is entirely voluntary, I can withdraw consent at any time. I have understood that

- The reason for the research is to find out the cause to effect relationship between lipid profile and CAD.
- No discomforts or stresses are foreseen.
- No risks are foreseen. This choice will not affect the daily routine of the school.
- No invocatory procedures are involved.
- The results of this participation will be kept confidential.
- The researchers will answer any further questions about the research, now or during the course of the project, and can be reached by phone at 301610251.

(Please sign both copies of this form Keep one and return the other to the investigators)

Name and Signature of Researcher Name and Signature of Participant

APPENDIX – VI

TOOL FOR DATA COLLECTION

Structured questionnaire to collect the personal details and to assess the lipid profile scores of the participants

PART – I : DEMOGRAPHIC DATA

Instructions to the respondent:

Dear participants, I would like to ask you some personal questions. Please give necessary information. All the information provided will be kept confidential.

1)Age of the patient

a) 26-35 years
b) 36-45 years
c) 46-55 years
d) 56-65 years
e) 66-75 years

2) Gender

a) Male
b) Female

3) Religion

a) Hindu
b) Muslim
c) Christian

4) Residential area

a) Rural
b) Urban

5) Education

a) Uneducated
b) 1-8 th standard
c) 9-12 th standard

d) Degree and above

6) Occupation

a) Unemployed
b) Labour
c) Non Professional
d) Professional

7) Marital status

a) Unmarried
b) Married
c) Separated/Divorced
d) Widow/Widower

8) Dietary pattern

a) Vegetarian
b) Non vegetarian

9) Type of work

a) Sedentary
b) Moderate
c) Strenous

10) Smoking history

a)Yes
b)No

11) Alcoholic history

a)Yes
b) No

12) Comorbid disease

a)Diabetes Mellitus
b)Hypertension
c)Both
d)None

PART – II : LIPID PROFILE TEST

Lipoproteins	Decreased value	Normal value	Increased value
Total cholesterol	<150 mg/dl	150-200 mg/dl	>200 mg/dl

Triglycerides	< 40 mg/dl	40-140 mg/dl	>140 mg/dl
LDL	<65 mg/dl	65-170 mg/dl	>170 mg/dl
HDL	<35 mg/dl	35-170 mg/dl	>170 mg/dl

Scoring :

Lipoproteins	**Decreased value**	**Normal value**	**Increased value**
Total cholesterol	1	2	3
Triglycerides	1	2	3
LDL	1	2	3
HDL	3	2	1
Total score	**6**	**8**	**10**

So the maximum score of lipid profile was 10 and minimum score was 6. And for this study it was considered that patients falls between 1-5 was less prone to get coronary artery disease and the patient falls between 6 -10 were more prone to get coronary artery disease.